A.R.E.A. CONVENTION and EXHIBIT-IN-PRINT NUMBER

MARCH 17, 1945

Railway Age

Founded in 1856

THE LIBRARY OF CONGRESS SERIAL RECORD
MAR 20 1945
COPY
GIFT

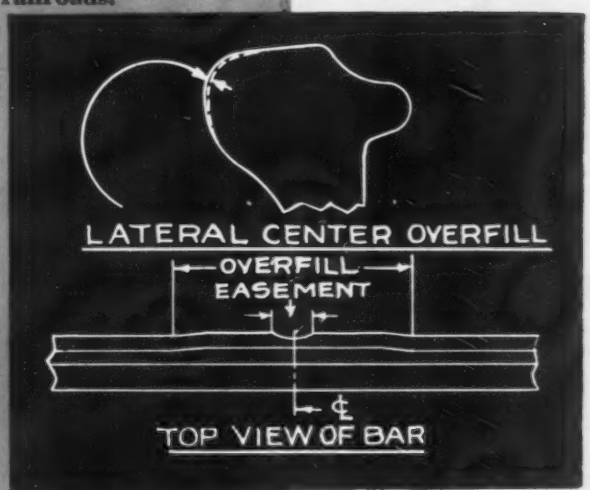
EVOLUTION

From Fish Plate to Modern Rail Joint

THE above features, together with utilization of scientific distribution of metal to obtain greater strength with minimum weight in joint design have saved millions of dollars for the railroads.

A comparatively recent feature, illustrated at the right — the center lateral overfill and easement applied to Headfree joints — now largely used, lengthens the life of both rail and joint.

These improvements, with many others, have been introduced and developed by this company, which has devoted over fifty years exclusively to the design, manufacture and service of rail joints.



MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

The Rail Joint Company, Inc.

50 Church St., New York 7, N. Y.

MT. VERNON
Chilled Car Wheels

MT. VERNON wheels are made in one of America's most modern and completely mechanized foundries.

MECHANIZATION *Plus* PRECISION CONTROL

Mechanical handling plus precise control of all operations accounts for the amazing uniformity in the quality of Mt. Vernon chilled car wheels. Constant research in the Mt. Vernon metallurgical laboratories has resulted in longer life, more ton-miles per wheel. Service records contain ample proof of the remarkable wearing qualities of Mt. Vernon wheels.

MT. VERNON CAR MFG. CO.

MT. VERNON, ILL.

PORTER Better Built Equipment Established 1866

Division of H. K. PORTER COMPANY, Inc.

PITTSBURGH 22, PENNSYLVANIA

Factories at Mt. Vernon, Ill. • Pittsburgh, Pa. • Blairsville, Pa. • McKeesport, Pa.
Newark, N. J. • New Brunswick, N. J.

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription price $6.00 for one year U. S. and Canada. Single copies, 25 cents each. Vol. 118, No. 11.

WROUGHT STEEL MAKES A TOUGH WHEEL

Yes, and you are assured of the utmost in dependability and long service when the wrought-steel wheels you use are stamped "Bethlehem."

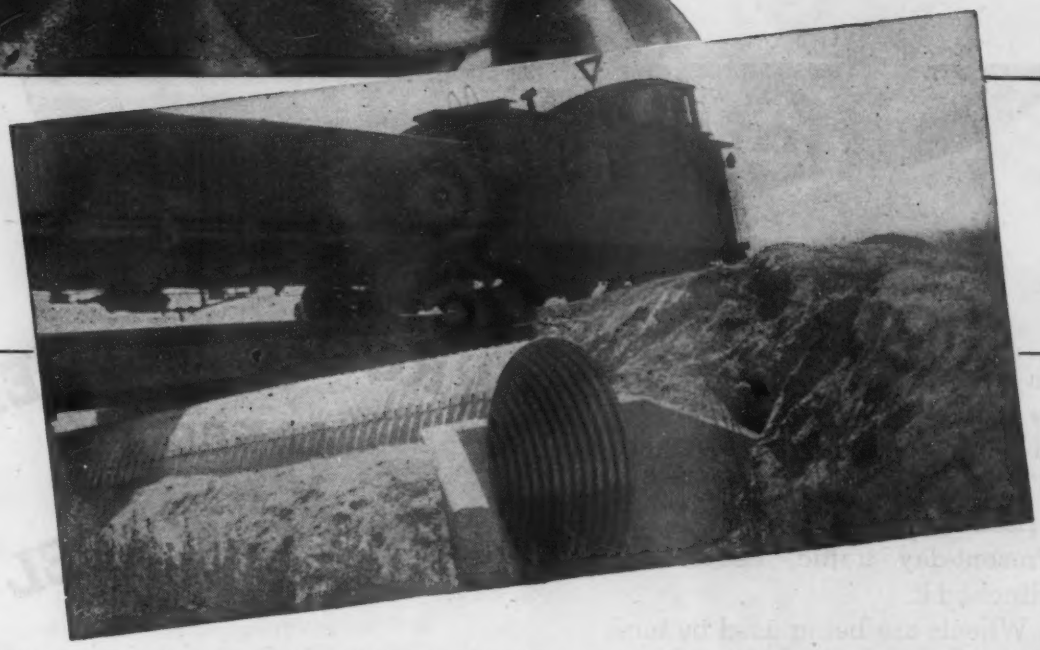
Years of peacetime traffic proved that statement. Present-day traffic, heaviest in history, has clinched it.

Bethlehem Wheels are being used by most of the country's greatest railroads and are helping them to carry their wartime loads. The same is true of their running-mates, Bethlehem Axles. This approval wasn't won the easy way. It is based on the cold, hard foundation of mileage per unit.

For either passenger or freight service, you can't get a better wheel or axle than Bethlehem makes. Remember that, in both your present and postwar planning.

BETHLEHEM WHEELS AND AXLES

He puts new "backbones" in tottering trestles



This maintenance superintendent on a main-line railroad rebuilds with ARMCO MULTI PLATE whenever a budget-eating trestle or bridge becomes unsafe.

It's easy to see why he relies on MULTI PLATE for new bridge jobs or replacements. Using these rugged structures, small bridges are relined or replaced in a few days, without interrupting traffic. Unskilled men can assemble the curved plates quickly, bolt them together, and then backfill. Any kind of headwall design can be used.

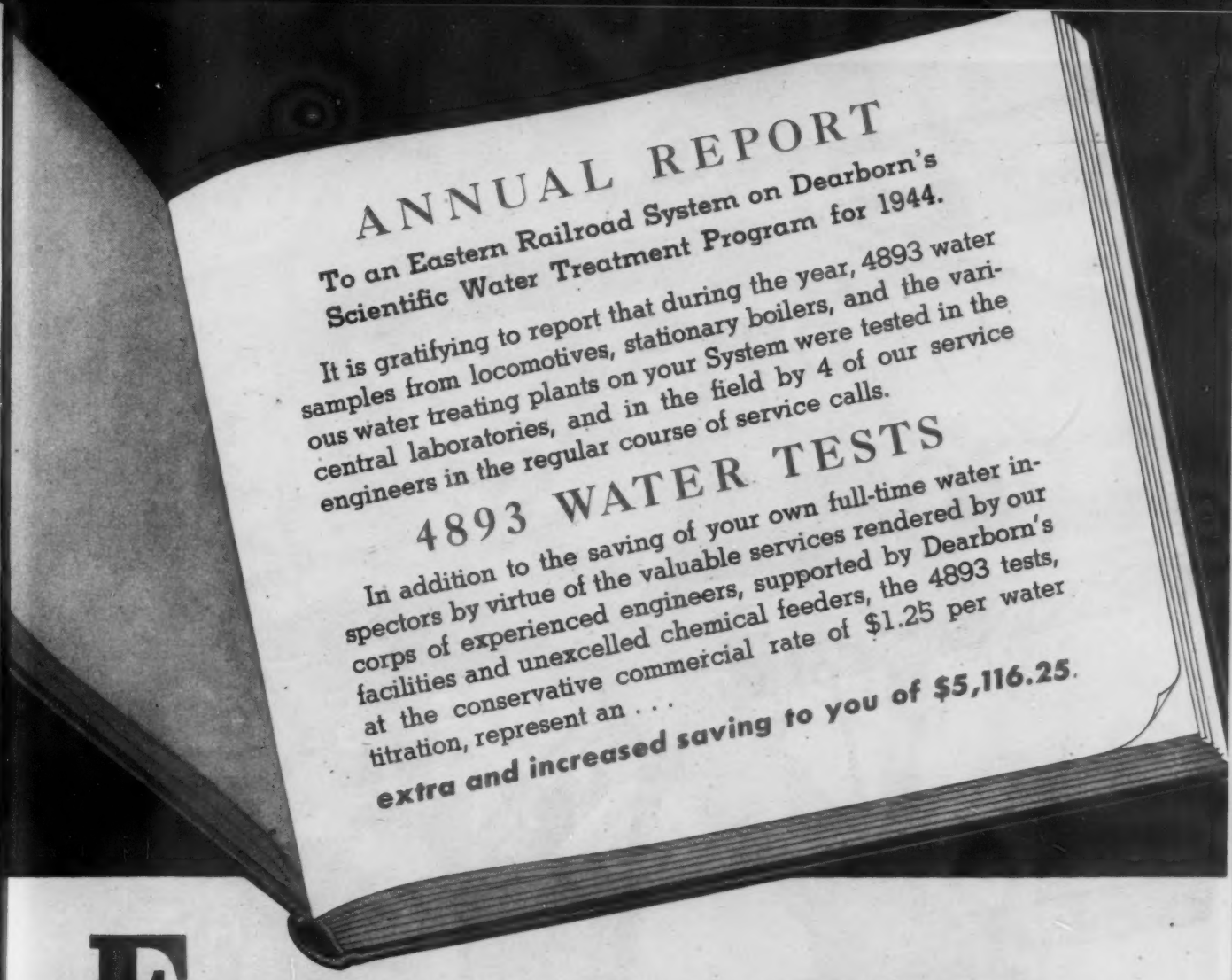
Learn how quickly you can repair or replace troublesome drainage structures with ARMCO MULTI PLATE. You'll be ahead on your postwar operations if you plan now on using MULTI PLATE in your modernization program. You can get all the facts from the Armco Railroad Sales Co. Incorporated, 491 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

MULTI ARMCO PLATE

Armco Multi Plate

A PRODUCT ORIGINATED AND DEVELOPED BY ARMCO ENGINEERS


ANNUAL REPORT
To an Eastern Railroad System on Dearborn's Scientific Water Treatment Program for 1944.
It is gratifying to report that during the year, 4893 water samples from locomotives, stationary boilers, and the various water treating plants on your System were tested in the central laboratories, and in the field by 4 of our service engineers in the regular course of service calls.
4893 WATER TESTS
In addition to the saving of your own full-time water inspectors by virtue of the valuable services rendered by our corps of experienced engineers, supported by Dearborn's facilities and unexcelled chemical feeders, the 4893 tests, at the conservative commercial rate of $1.25 per water titration, represent an . . .
extra and increased saving to you of $5,116.25.

FIGURES TO CONSIDER...

when operating costs assume importance again

Annual reports by Dearborn to the railroads on services rendered during the preceding year always reflect the economies made possible by Dearborn Scientific Water Treatment Program.

Frequent check-up of water conditions at central water testing laboratories, coupled with necessary and supplementary control work in the field . . . in close co-operation with the railroads' own force . . . develop and effect substantial reductions in operating costs.

When these services are augmented by Dearborn water treatment materials, applied to wayside water supplies with Dearborn super-accurate chemical proportioners, the Dearborn water treatment program is rounded out into a complete cycle of scientific efficiency.

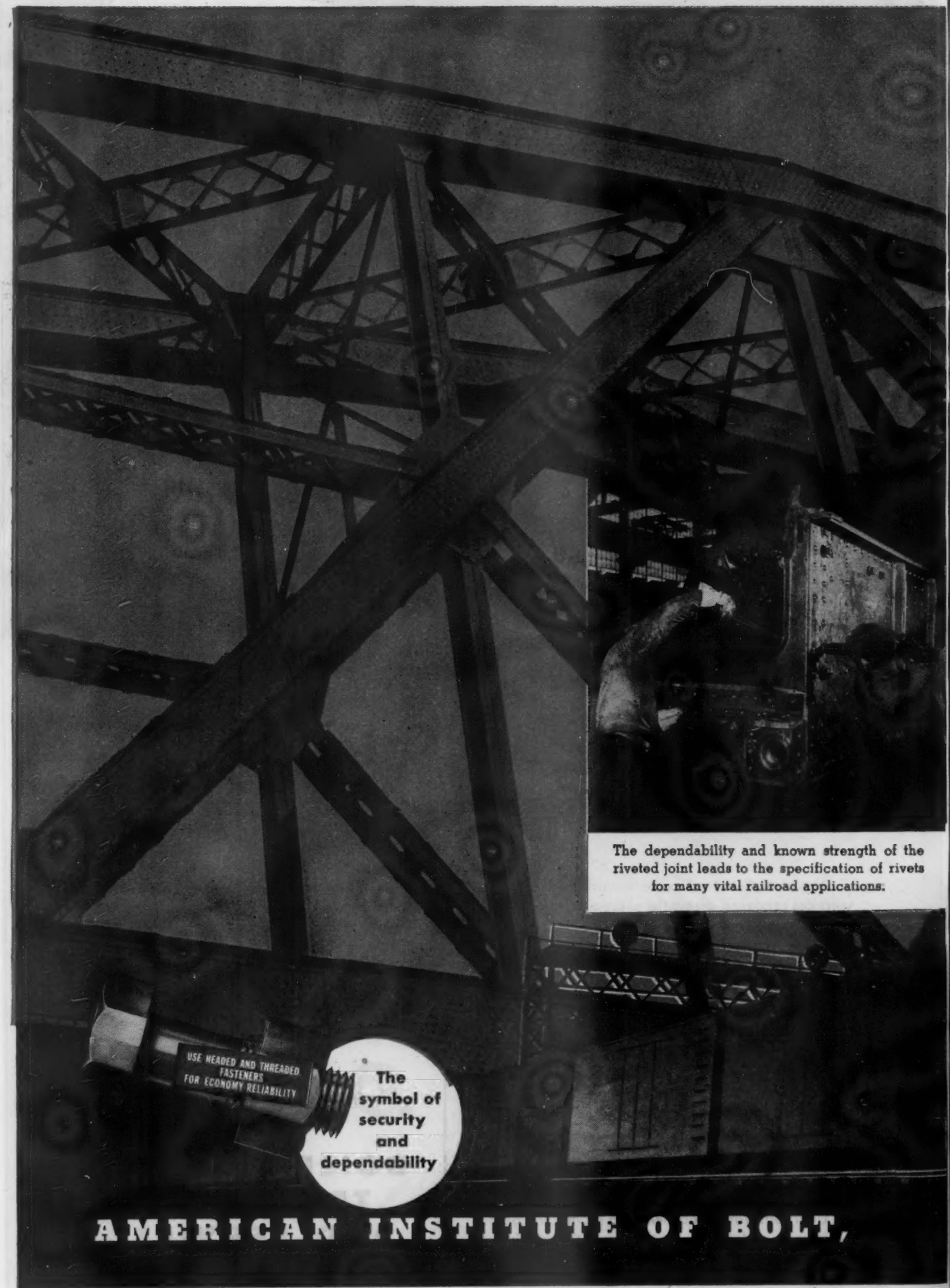
Dearborn water treatment and service will be an even more welcome means of locomotive efficiency, and annual reports which show a definite saving will be held in even higher regard when railroads resume normal schedules and reins are again tightened on operating costs. Call the Dearborn Engineer in your territory or write to us direct.

DEARBORN CHEMICAL COMPANY

310 S. Michigan Ave., Chicago 4 — 807-15 Mateo St., Los Angeles
205 E. 42nd St., New York — 2454 Dundas St., West, Toronto

Dearborn
TRADE MARK REGISTERED

BOILER WATER TREATMENT AND SERVICE



The dependability and known strength of the riveted joint leads to the specification of rivets for many vital railroad applications.

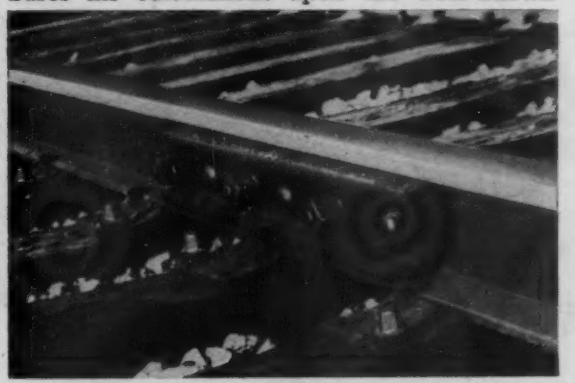
AMERICAN INSTITUTE OF BOLT,

Where Safety is Vital

RAILROADS USE FASTENERS

NUTS BOLTS SCREWS RIVETS

Because they can safely depend upon the known strength of bolted and riveted joints, designers and builders of railroad equipment rightfully place confidence in FASTENERS. There need be no fear of unexpected weaknesses developing when a competent design engineer bases his calculations upon the well-known and time-proved factual data that is available on these joints.



Improved and perfected through constant study, the bolted rail joint is a vital and dependable link in railroad equipment.

Designers and manufacturers of appliances, machinery and equipment of all types have learned to depend fully upon fasteners for security and economy. Made by modern manufacturing methods, fasteners are available everywhere in a great variety of styles, sizes and materials to suit individual needs.

When you use modern bolts, rivets or screws for your products, you follow the example of an industry—the Railroads—that deals in safety and economy month after month, year after year.

NUT AND RIVET MANUFACTURERS

1550 HANNA BUILDING · CLEVELAND 15, OHIO

Fairmont Serves

WITH A COMPLETE LINE OF MOTOR CARS

INSPECTION CARS

M9 Series E.....1-2 Men—Aluminum
M9 Series F.....1-2 Men—Aluminum
59 Series C.....1-2 Men
59 Series D.....1-2 Men
M19 Series D.....1-4 Men—Aluminum
M19 Series E.....1-4 Men—Aluminum

SECTION CARS

M14 Series E.....1-6 Men
M14 Series G.....1-6 Men
S2 Series E.....1-8 Men
S2 Series F.....1-8 Men
S2 Series G.....2-10 Men

GANG CARS

MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

A3 Series C.....20 H.P.....4 Speeds Forward and Reverse
A5 Series C.....36 H.P.....4 Speeds Forward and Reverse
A6 Series C.....85 H.P.....4 Speeds Forward and Reverse

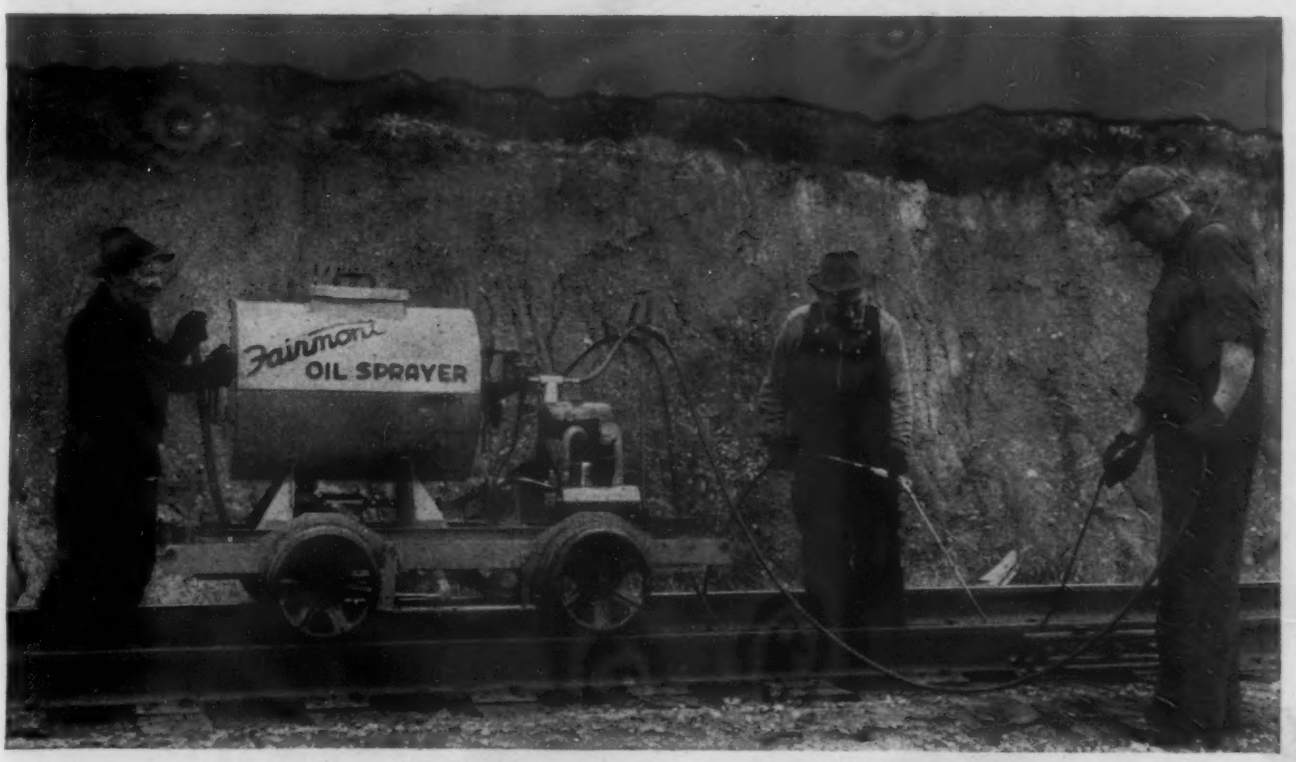
Write for Specifications and Complete Details

FAIRMONT RAILWAY MOTORS, INC. • FAIRMONT, MINNESOTA

PERFORMANCE PLAN

The Railroads

WITH TIME AND LABOR SAVING WORK EQUIPMENT



OIL SPRAY CAR

W61 Series A—Pressure Oiling for Rail Joints, Switches, etc.

WEED BURNERS

W44 Series B.....Open Flame.....3 Nozzle
W55 Series A.....Open Flame.....5 Nozzle
M27 Series G.....Oven Type

EXTINGUISHER CARS

T27 Series C.....Tank and Pump
T28 Series A.....Tank only

BALLAST DRAINAGE CARS

M23 Series E....Ballast Drainage Power Unit
M25 Series D....Ballast Discer

WEED MOWERS

W54 Series D.....One Cutter Bar
M5 Series A.....Two Cutter Bars
M24 Series E.....Two Cutter Bars

DERRICK CAR

W60 Series A....Load Capacity 3000 Pounds

SPOT BOARD

High Speed Spot Board—Used With or Without Grade Stakes

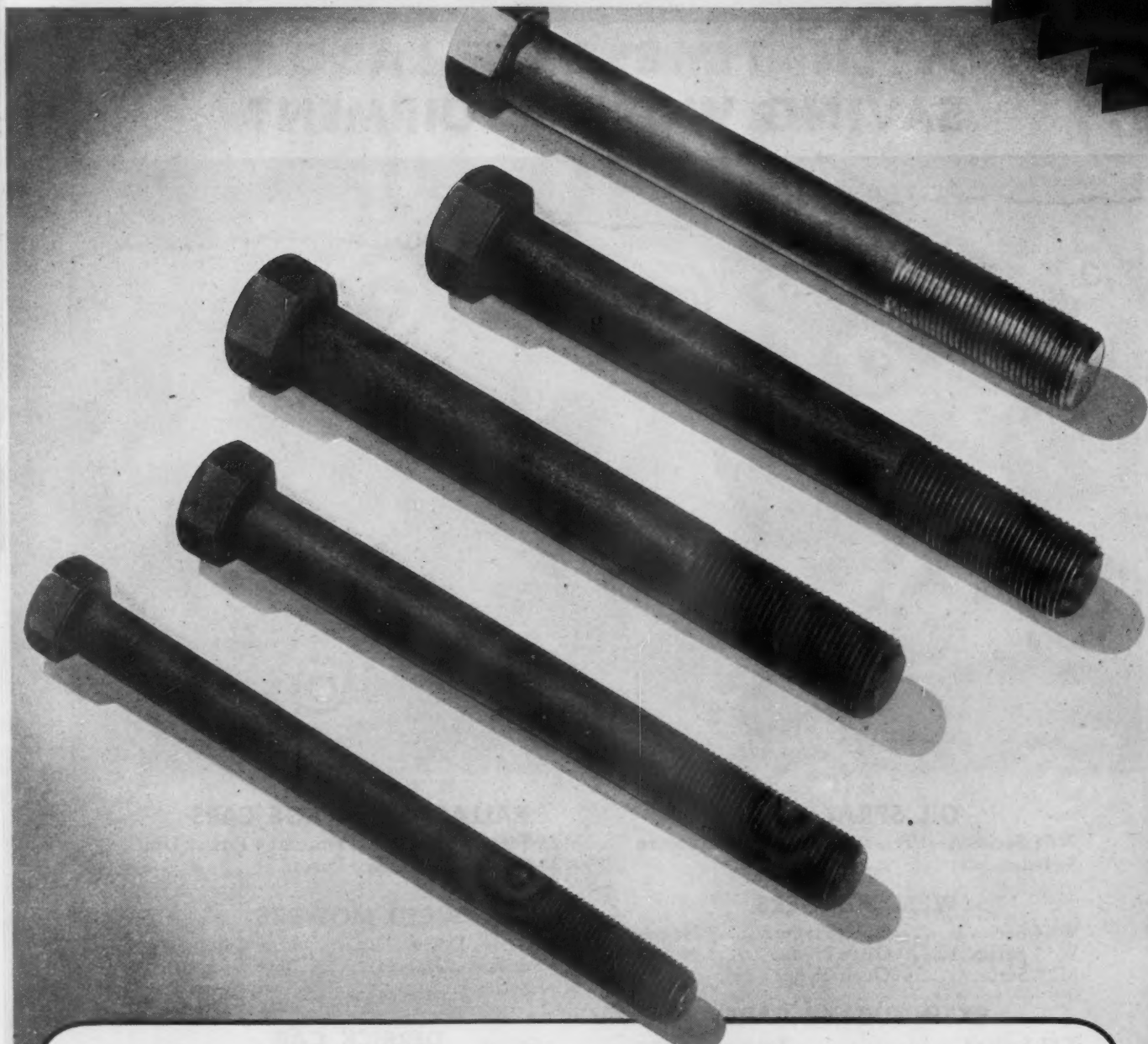
MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

Write for Specifications and Complete Details

FAIRMONT RAILWAY MOTORS, INC. • FAIRMONT, MINNESOTA

THE JOB COUNTS

Three bolts that look alike



Diameter of bolt.....	¾"	¾"	¾"	⅝"	⅝"	½"	½"
Actual breaking load.	26,300 lbs.	43,900 lbs.	52,600 lbs.	30,000 lbs.	36,000 lbs.	18,600 lbs.	22,300 lbs.
Weight per 100 bolts..	85 lbs.	85 lbs.	85 lbs.	58½ lbs.	58½ lbs.	37 lbs.	37 lbs.
Ultimate tensile strength	60,000 psi	125,000 psi	150,000 psi	125,000 psi	150,000 psi	125,000 psi	150,000 psi
Material.....	SAE 1020	SAE 1035	SAE 3135 or NE Equivalent	SAE 1035	SAE 3135 or NE Equivalent	SAE 1035	SAE 3135 or NE Equivalent
Heat treatment.....	None	Quench, draw	Quench, draw	Quench, draw	Quench, draw	Quench, draw	Quench, draw
Threads per inch.....	16	16	16	18	18	20	20
Root diameter.....	0.669 in.	0.669 in.	0.669 in.	0.553 in.	0.553 in.	0.435 in.	0.435 in.
Area at root diameter.	0.351 sq. in.	0.351 sq. in.	0.351 sq. in.	0.240 sq. in.	0.240 sq. in.	0.149 sq. in.	0.149 sq. in.
Length under head....	6 inches	6 inches	6 inches	6 inches	6 inches	6 inches	6 inches

Above data shows essentials of some of the timeliest advice given by Lamson engineers. It shows how and why a smaller bolt using 57% less steel will carry the same load in tension as the larger bolt!

...AND ARE ALIKE, IN SIZE...BUT WHAT A DIFFERENCE YOUR LABORATORY WOULD FIND IN THEM!

● Three of these bolts photographed have exactly the same dimensions—¾" x 6"—*and there their resemblance ends.*

We have arranged them in the photograph to match up with the table of their physicals, at left, below, where you may compare these three bolts, point by point. And in the variation of their physicals lies your opportunity to profit by Lamson & Sessions' "know how", always at your command without obligation.

It is obvious that bolts in larger and smaller sizes than those shown, made of the same materials, made the same way, properly heat treated, will develop proportionately the same physicals and characteristics as these three bolts.

What about the fifth and smallest bolt? We'll tell you. Note that it also is the same length as the others, but it is only ½-inch in diameter, or less than half the weight of the bolt made of SAE 1020 steel with corresponding physicals! It will carry approximately the same load in tension as the larger bolt.

Do you want to save weight in the bolted assembly you are laying out? Do you want to save critical materials and get faster deliveries? Do you want to use every means in conserving war materials?

If you will apply the principles involved in modern bolt engineering, and design for, and specify, a bolt having the required strength you need in the smallest possible size—you will have accomplished all three objectives mentioned above! Saving weight is a prime objective today whether you're building a bomber, a tank, a gun carriage, a ship or anything else—and you can save weight if you can design to use a bolt one-half the size *you thought you needed.*

Requiring less material, by 50%, than its larger counterpart above, having the same strength—the fifth bolt shown, if we made it for you, would allow us to draw that much less upon critical materials; we would need a smaller inventory of materials, and less shipping space would be needed for the finished bolts because we can ship twice as many bolts in the smaller size than the larger size. A whole train of favorable circumstances is set in motion when you let bolt engineers help you engineer a smaller bolt into your designs!

Ask Lamson engineers for solutions to your fastening problems. Maybe out of their vast experience they can help you. Lamson "know how" is at your disposal *now, and after the war is ended.*

THE LAMSON & SESSIONS COMPANY, General Offices, Cleveland

"BOLTS, NUTS & SCREWS"—1944 REVISION, Cloth bound, Limited edition, 180 pages of technical, practical information. Sent prepaid for *$1.00—cash or check must accompany your order.*

"BOLTS ARE IMPORTANT!"—24-page booklet of currently useful information for buyers of headed and threaded products, and describing Lamson & Sessions' specialty fastenings which have wide industrial applications *—now, and in the post-war period. Sent gratis.*

"THE LAMSON BLUE BOOK"—is our standard Catalog of standard products excepting our Aircraft products. *Sent gratis.*

"SIMPLIFIED STOCK LIST"—Of bolts, nuts and screws, conforming to latest revisions of the Office of Price Administration, and of great value in showing you in what ratio quantities of various standard products are kept in stock for deliveries, by your jobbers and in our own (and other bolt manufacturers') warehouse stocks. *Sent gratis.*

HERE'S A COUPON FOR YOUR CONVENIENCE

THE LAMSON & SESSIONS COMPANY • 1971 West 85th Street • Cleveland 2, Ohio

Please send us ☐ Lamson Blue Book ☐ Bolts, Nuts & Screws ($1.00)
☐ Bolts are Important! ☐ Simplified Stock Sizes

Name of Individual _____ Title or Kind of Work _____

Employed by (Name of Company) _____

Street Address _____

City and State _____

No. 1896—Copyright 1944—The Lamson & Sessions Co.

LAMSON & SESSIONS

BOLTS · · NUTS · · COTTERS · · CAP SCREWS · · SPECIALS

Your Jobber Stocks the Lamson Line

Asbestos, nature's "magic mineral," cannot rot, rust or burn. Combined with other materials, it brings strength and durability to many products used for railway construction and operation.

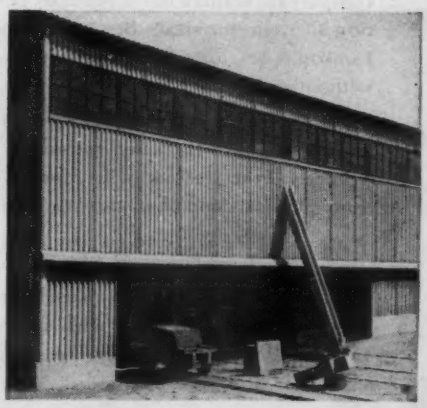
KEEP UPKEEP DOWN

Use these J-M Products made of ASBESTOS

•TODAY, when buildings and equipment must serve longer to save manpower and keep war traffic moving, it's more important than ever to use materials that *last.*

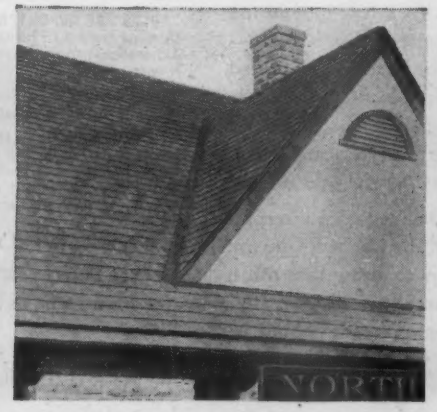
From asbestos, Johns-Manville fabricates many materials that successfully meet this requirement. By making frequent replacements unnecessary . . . by reducing shutdown time on operating equipment . . . by insuring long-term protection to railway structures, these J-M products are contributing to lower maintenance costs in every department of railroad operation.

Find out how these products made of asbestos can help you reduce upkeep and safeguard buildings and equipment. For full details, write Johns-Manville at New York, Chicago, Cleveland, St. Louis or San Francisco.

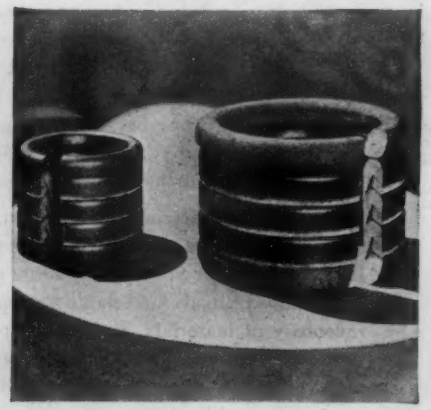


Corrugated Transite Siding and Roofing is made of asbestos and cement. Strong and durable, it cannot burn, rot, rust or corrode, needs little if any maintenance over the years.

Transite Pipe for low-cost water and sewer lines. Made of asbestos and cement, it cannot tuberculate, is highly resistant to soil corrosion. Light in weight; easy to handle and install.



J-M Asbestos Shingles for roofs and sidewalls, protect railroad buildings against fire and weather, reduce upkeep to a minimum. Available in a range of attractive colors and styles.



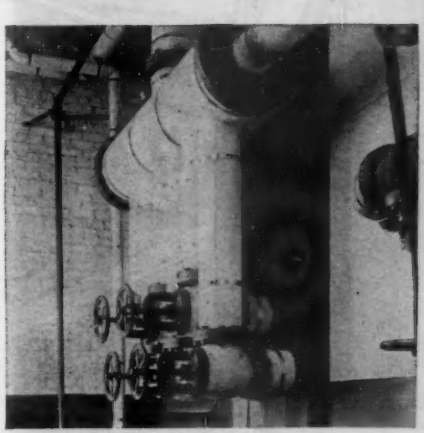
J-M Packings are made in specialized forms and styles for all types of service equipment. The J-M Standardized Packings Plan is helping many roads reduce costs, speed repairs.

JOHNS-MANVILLE JM PRODUCTS

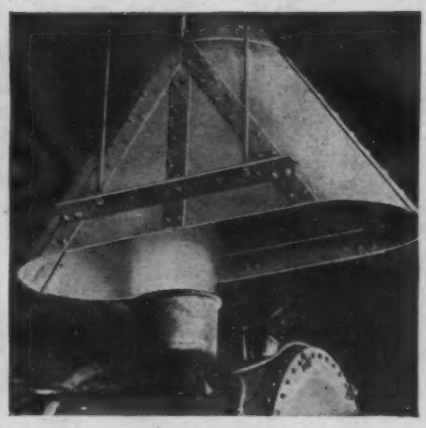
Johns-Manville

WITH THE "Magic Mineral"

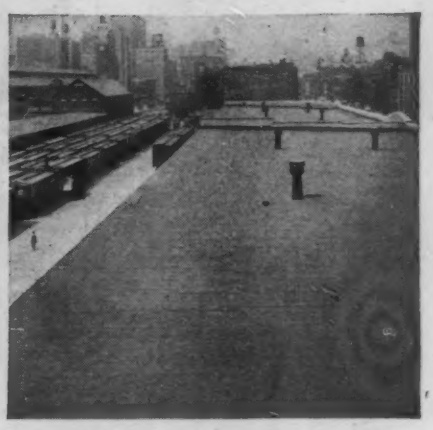
to reduce maintenance costs, safeguard buildings and equipment



J-M Insulations, the standard for 87 years, conserve fuel, maintain their high efficiency in service. For every railroad requirement, from power plant to locomotive boiler lagging.



Transite Smoke Jacks reduce upkeep in the roundhouse. Fireproof, rotproof and corrosion-resistant, they get rid of smoke and fumes at lowest possible long-term cost. A type for every need.



J-M Asbestos Built-up Roofs protect against fire . . . require no mineral surfacing or periodic coating. Many have been in service for 20-25 years and longer with little or no upkeep cost.

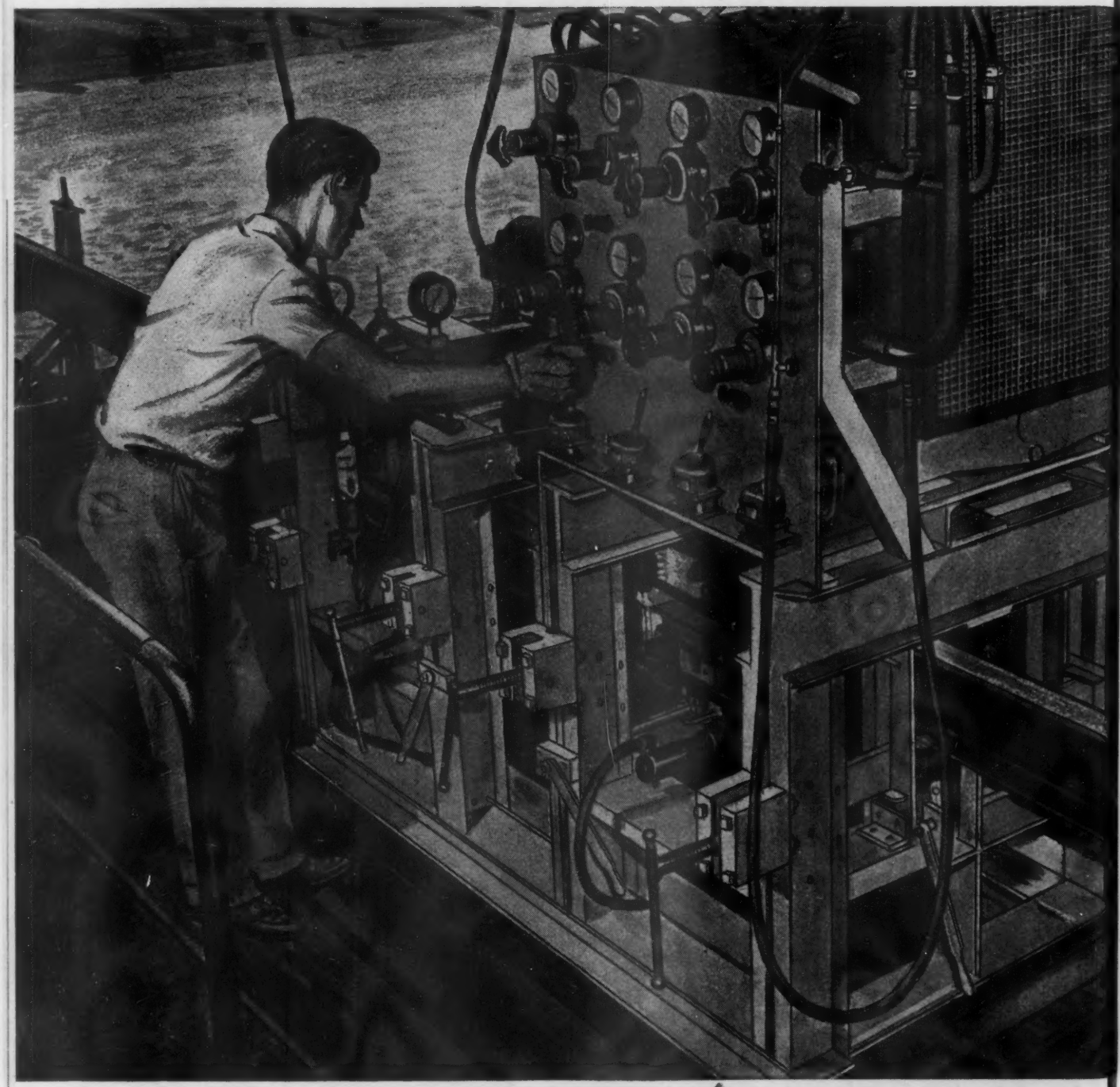
J-M Friction Materials for brakes and clutches of cranes, draglines, tractors and other equipment. Reduce "time out" for maintenance, help keep equipment on the job.

J-M Asphalt Tile, one of the most economical of flooring materials to maintain, withstands years of heavy traffic with no upkeep except cleaning. Available in many attractive patterns.

J-M Asbestos Flexboard provides finished interior walls that are attractive and easy to maintain. Fireproof, rotproof, needs no painting. Comes in large sheets for easy application.

87 Years of Service to Transportation

Insulations • Packings • Friction Materials • Refractory Cements • Building Materials



Four Oxweld Methods

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York

MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

SINCE 1912—THE COMPLETE OXY-ACETYLENE

Pressure-Welding of Rail

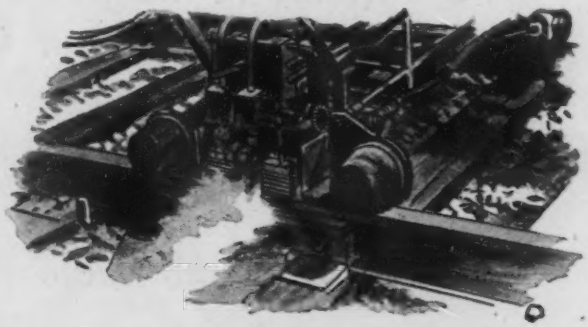
Rails joined by Oxweld's pressure-welding method are uniformly strong and provide a continuous, smooth-riding surface which is free from end batter. Joint maintenance is eliminated.

Flame-Straightening of Joint Bars

Worn joint bars, which permit sag at the joints and intensify the effects of rail-end batter, can be quickly and economically straightened by Oxweld's semimechanized method.

Building-Up Worn Trackwork

The cost of rebuilding battered rail and trackwork amounts to a fraction of the expense of replacing with new material. OXWELD MW welding rod has been especially designed for this purpose.



Flame-Hardening of Rail Ends

Oxy-acetylene flame-hardened rail ends retard batter and in so doing reduce wear on joint bars and bolts. Oxweld's end-hardening method does not interrupt traffic.

That Make Rail Last

OXWELD RAILROAD SERVICE

The words "Oxweld" and "MW" are registered trademarks of Union Carbide and Carbon Corporation

SERVICE FOR AMERICAN RAILROADS

Saturday, March 24th, at 8:30 P. M.

ALLIS-CHALMERS Salutes the

RAILROAD INDUSTRY

—Pays tribute to the Men and Women of this great industry on the famous

BOSTON SYMPHONY

Saturday Night Radio Program

TUNE IN THIS TRIBUTE. Listen and be proud as a nation-wide network of 189 radio stations tells America of your industry's great contribution to the war effort . . . the production records you and your associates have helped to set, the many ways your industry is helping to speed Victory! It's a salute to you . . . to every man and woman working in America's great Railroad Industry. Don't miss it!

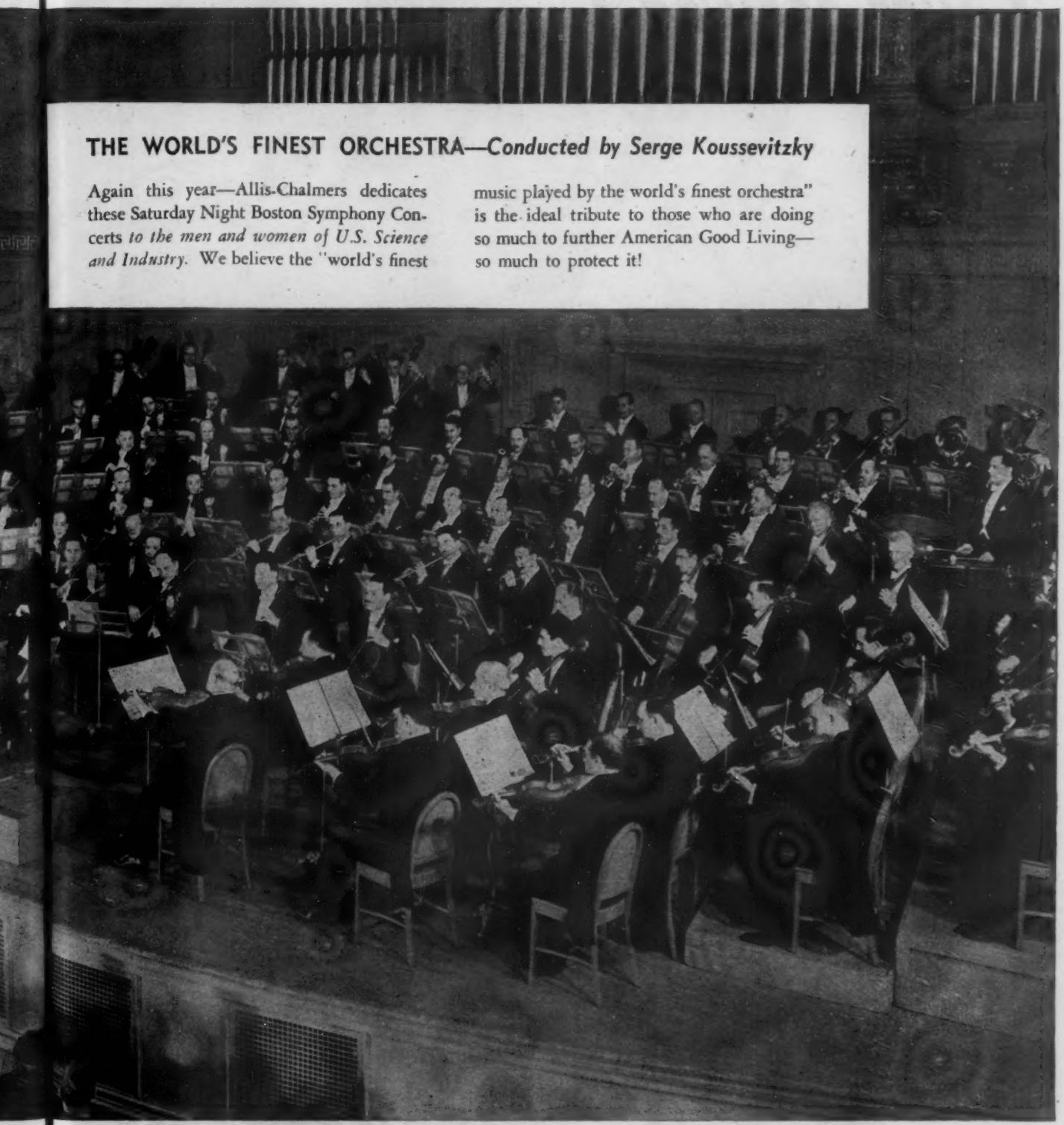
Check Your Local Paper for Time and Station

ALLIS-CHAL

(E.W.T.) over 189 stations of the Blue Network

THE WORLD'S FINEST ORCHESTRA—*Conducted by Serge Koussevitzky*

Again this year—Allis-Chalmers dedicates these Saturday Night Boston Symphony Concerts *to the men and women of U.S. Science and Industry.* We believe the "world's finest music played by the world's finest orchestra" is the ideal tribute to those who are doing so much to further American Good Living—so much to protect it!



LMERS

"Engineering That Aids All Industry Furthers American Good Living"

Just arrived!

A NEW GENERATION OF TRAVELERS

Born . . . is the word! Out of the turmoil of war has emerged a whole multitude of new travelers. Soldiers, sailors, marines, airmen! WAVES, WACS, SPARS and MARINES! Their mothers, wives and sweethearts! Migrating labor and Government employees!

Millions of them had never *really* traveled before. . . . But now they know the miraculous service of our transportation companies during this war. . . . Now a whole new generation of travelers knows the meaning of modern transportation service, with its conveniences, its comforts,— its safety,— its speed and its thrill!

During the war and after the war the American Locker Company will continue to cooperate in every possible way. . . . American Locker Service will keep pace with the demands of this new generation of travelers!

AMERICAN LOCKER COMPANY, Inc.
211 CONGRESS ST., BOSTON 10, MASS.

BOSTON NEW YORK PHILADELPHIA PITTSBURGH
ATLANTA CLEVELAND CHICAGO DALLAS LOS ANGELES

A Nation-Wide Service

TODAY'S TRAVELING PUBLIC LOOKS FIRST FOR PARCEL LOCKERS

LERS

LOCKERS

RAILWAY AGE

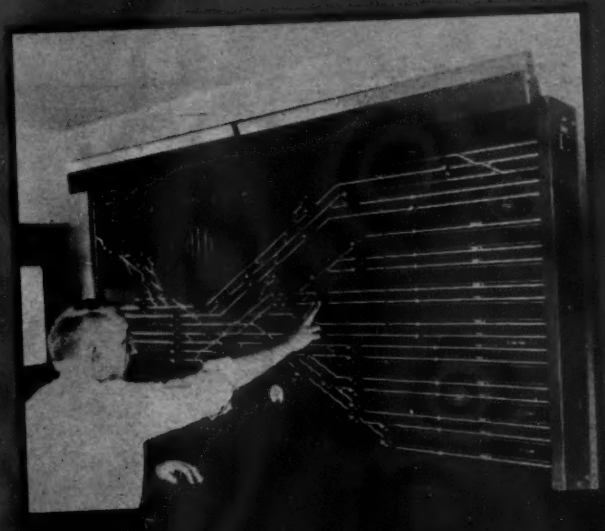
G-R-S MODERN SIGNAL SYSTE

CENTRALIZED TRAFFIC CONTROL

Eighteen years ago G-R-S installed the first Centralized Traffic Control System. Since that time, G-R-S cTc on thousands of miles of track have shown results such as:

INCREASED GROSS TON MILES PER TRAIN HOUR	7 to 57%
MINUTES SAVED PER FREIGHT TRAIN MILE	50 to 1.89
TIME SAVED PER FREIGHT TRAIN TRIP	17 to 32%
RETURN ON INVESTMENT (PER ANNUM)	12.7 to 120%

Other benefits not easily computed into round figures are: increased track capacity; postponement of double tracking; increased availability of locomotives, cars and men; and savings in critical materials.



THE NX SYSTEM OF ELECTRIC INTERLOCKING

Its name, "NX", means eNtrance-eXit. It is a simplified system of directing trains through busy terminals. To line up a route, the operator merely pushes an eNtrance knob and an eXit button in the route desired on his control panel—NX takes over—throwing switches, clearing signals and indicating the train's progress by lights.

AUTOMATIC BLOCK SIGNALS

There are nearly 99,000 track miles of automatic block signaling now in use on American railroads. On single- or multiple-track lines Automatic Block Signals increase track capacity, improve operating efficiency and increase safety —thus effecting economies.

GRS

General Railway S

MS KEEP TRAFFIC MOVING

REMOTE CONTROL

Provides a simple, inexpensive means of operating electrically, switches and signals at passing sidings, ends of double track, crossings, junctions, yard approaches, drawbridges and similar layouts from a conveniently located control point nearby or several miles distant. Eliminating tonnage train stops, operating costs are decreased by reducing delays and fuel consumption.

CAR RETARDERS

Approximately 1/3 of the time required to move railroad freight from its point of origin to its destination is lost in classification yards. On roads where these systems are in use, classification time has been cut an average of 50%. These installations have also shown substantial savings in personnel and yard locomotive requirements.

CAB SIGNALS

One of the outstanding developments of modern signaling which has demonstrated its economy through better and faster operation with maximum safety. G-R-S Cab Signals may be used with or without Automatic Train Control - or - with or without Wayside Signals.

CODED TRACK CIRCUITS

Your rails are potential signal line wires. By their use with G-R-S Coded Track Circuit Control, you can be assured of proper signal operation regardless of weather. You can be assured of improved shunting sensitivity and greater protection against the effects of foreign current. You can also eliminate or reduce costly open line wires.

Signal Company

GRS

ERS

LOCKERS

AILWAY AGE

You Are Invited
to view a brief presentation
of modern methods for
expediting traffic...
on your Main Lines,
in your Terminals
and through your
Classification Yards.
with GRS
Signal Systems
and Appliances

CES

LS
high-speed
ess their de-
any signaling
ions and they
of power.

Better highballs

SPEEDING the movement of freight trains, reducing overtime and cutting car detention costs is partly a matter of better, quicker highballs. We make them. That is, we put telephones on freight trains, enabling conductors to call engineers, speed train movements.

Our telephones operate by radio, but function as simply and surely as the phone on your desk. Full telephonic quality voice communication is provided between dispatchers and moving trains, head and rear end, train to train and station to station. This equipment has been proved in routine freight service on several leading railroads. It requires no FCC frequency assignment, no licensed operators. It is available now. We've also designed VHF space radio equipment to operate on frequencies assigned to the railroads by the FCC. A demonstration can be arranged through any **Aireon** office. Descriptive literature on both systems is also available on request.

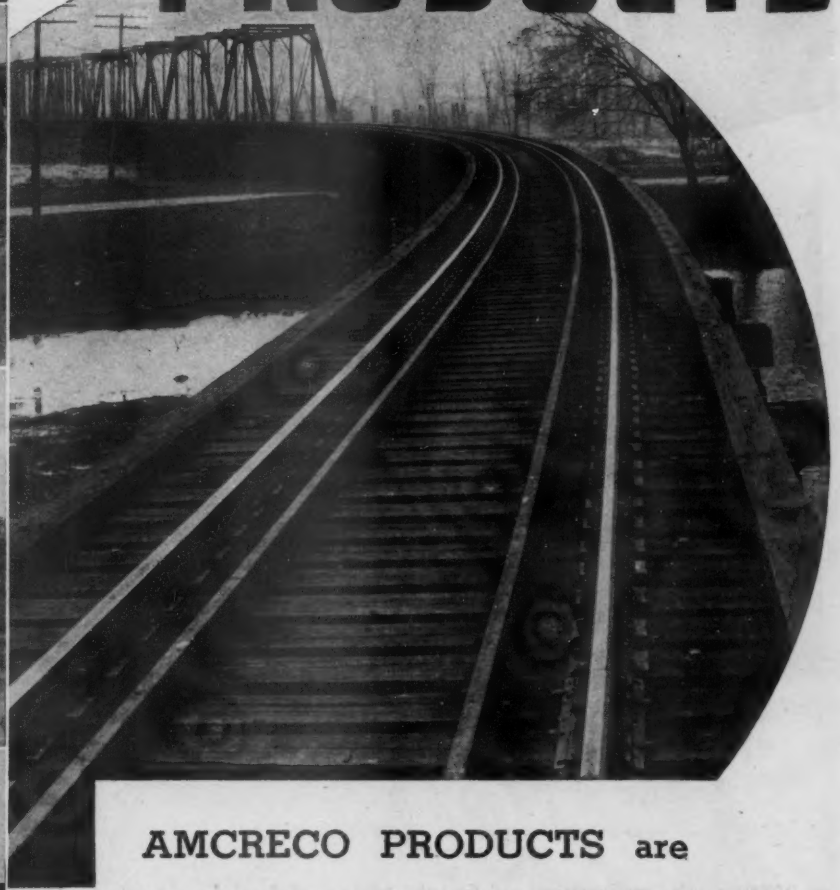
Aireon MANUFACTURING CORPORATION

Formerly *AIRCRAFT ACCESSORIES CORPORATION*

• Radio and Electronics • Engineered Power Controls

NEW YORK • • CHICAGO • • KANSAS CITY • • BURBANK

AMCRECO *Creosoted* PRODUCTS



AMCRECO PRODUCTS are an important factor in helping American railroads operate at maximum capacity, and in conserving materials needed for war production.

AMERICAN CREOSOTING COMPANY

INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

AMCRECO DOWRY PROCESS CREOSOTED

GEORGIA CREOSOTING COMPANY INCORPORATED

ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.

TIES · PILES · POLES · TIMBER

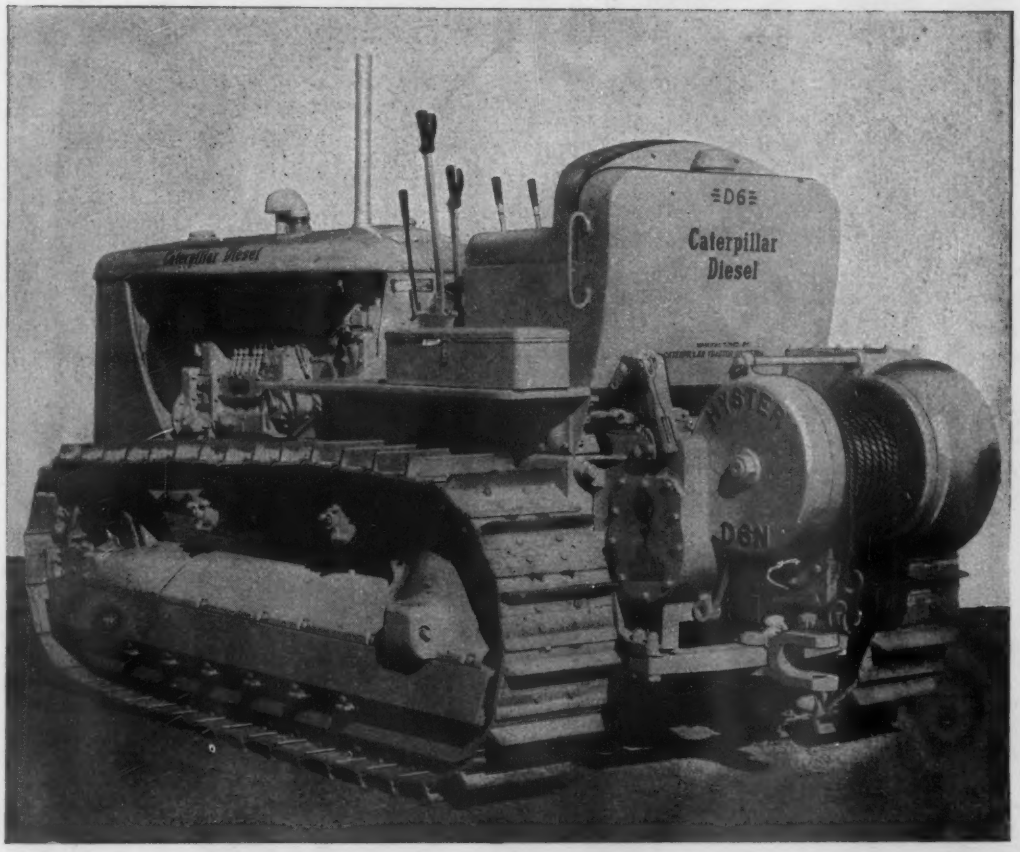
—wherever there are Railroads

. . . there is BUDA
DIESEL ENGINES
For switching locomotives.
RAIL BENDERS
Track tools, tie pullers, track liners, track jacks.
JACKS
Hydraulic and mechanical for all lifting jobs.
CHORE BOY
The gasoline-powered "truck of 1000 uses".
CROSSING GATES
Positive protection at crossings, bridges and plant entrances.
MOTOR CARS
Designed for easy handling and long economical life.
WHEELS
Demountable type, pressed steel, cold drawn.
BUMPING POSTS
Complete protection at low cost.
ARMY E NAVY

Behind the tremendous wartime achievements of American railroads are great quantities of specially designed tools and equipment, an important quantity of which has been supplied by BUDA to provide faster, safer, longer operation. WRITE OR WIRE FOR LITERATURE.

BUDA

15401 Commercial Avenue
HARVEY (Chicago Suburb) **ILLINOIS**



How to "Step Up" your tractor's USEFULNESS

Add HYSTER Towing Winches to your "Caterpillar" tractors — and increase the number of jobs they can do. HYSTERS step up the tractor's drawbar pull 50 per cent or more. Through this increased pulling power, and with longer cable reaches to maximum distances, many additional towing and spotting jobs can be done.

HYSTER direct-geared winches are sturdily built for the "hefty" towing or hoisting services that call for all-out pull. Anti-friction bearings give smooth operating efficiency. Control levers, handy to driver, may be operated while tractor is moving or stationary.

HYSTERS are especially designed and built for all "Caterpillar" models. Quickly installed, they don't interfere with regular services of tractor or drawbar. Your "Caterpillar" dealer sells, installs and services those husky HYSTERS. See him, or write for information.

345-34

Sold and serviced by "Caterpillar" dealers everywhere.

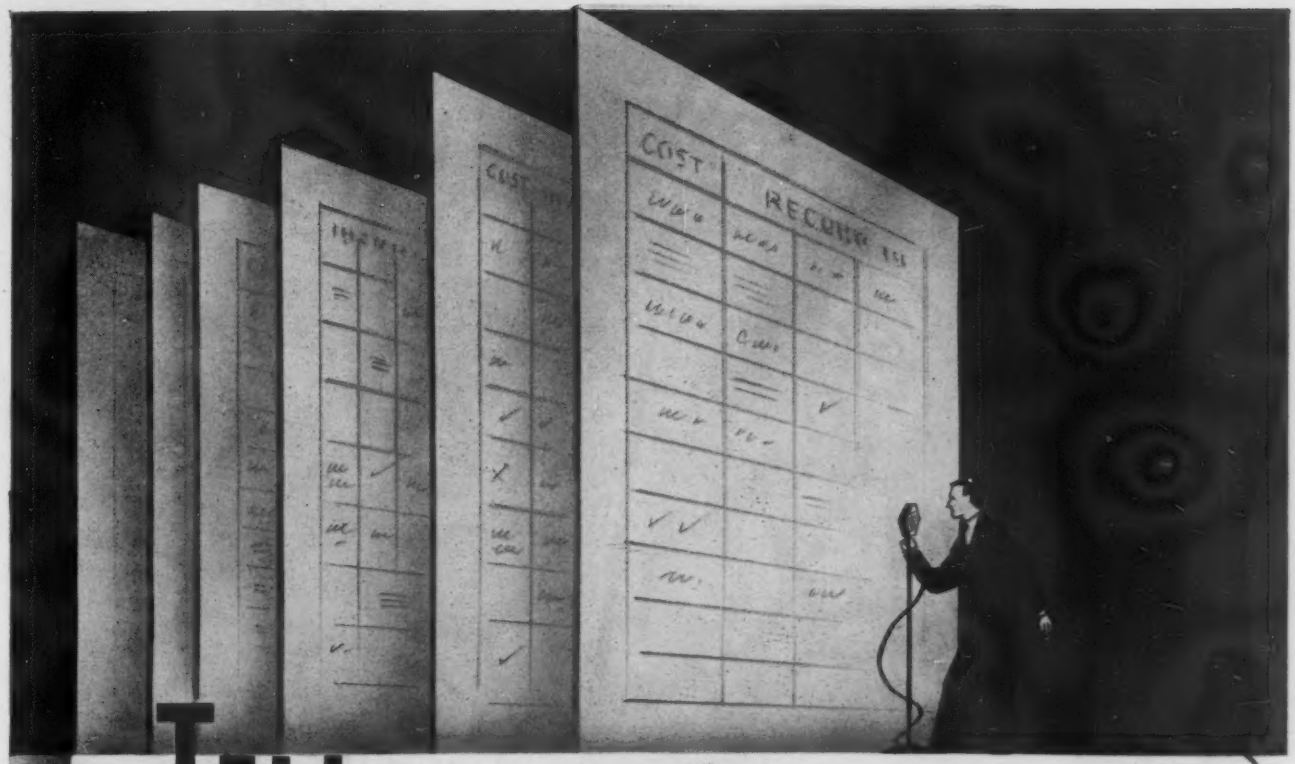
HYSTER COMPANY

2932 N. E. Clackamas Street
PORTLAND 8, OREGON

1832 North Adams Street
PEORIA 1, ILLINOIS

WORLD'S LARGEST MANUFACTURER OF TRACTOR HOISTS AND WINCHES

HYSTER
FOR ANY LIFT OR PULL



TELL *your Cost records* WHAT TO SAY....

Any good businessman pays strict attention to the facts his cost records tell him. But he doesn't let it go at that—he makes sure that his cost records *have the right kind of facts to deliver.*

When you use Clark Products you make sure that your own cost records will give a business-like report of painstaking engineering, of tough and enduring quality, of practical usefulness—stated in low cost performance and lasting satisfaction.

CLARK EQUIPMENT COMPANY • *Railway Division* • BATTLE CREEK, MICHIGAN

CLARK RAILWAY TRUCK . . . A PROMISE OF MORE COMFORTABLE TRANSPORTATION—SMOOTH, SWIFT, NOISELESS!

CLARK BLIND RIVETS . . . CUTTING ASSEMBLY TIME AND COSTS, REVOLUTIONIZING MANY PHASES OF PRODUCT DESIGN.

CLARK ELECTRIC STEEL CASTINGS . . . OF INTRICATE DESIGN AND VARIED SELECTIONS—OF UNIFORM FINE QUALITY.

CLARK GEARS AND FORGINGS . . . TRUSTED STAND-BY'S OF RAILROAD BUYERS—FOR ECONOMY AND SATISFACTION.

CLARK CELFOR DRILLS AND REAMERS . . . VETERAN "RAILROADERS" WITH A RECORD OF TOUGH DEPENDABILITY.

CLARK INDUSTRIAL TRUCKS AND TRACTORS . . . FAST, VERSATILE "DISCOVERERS" OF HUGE SAVINGS.

OTHER PRODUCTS OF CLARK—Metal Spoke Wheels, Front and Rear Axles, Axle Housings, Transmissions, Trailer Axle, Booster Unit, Torque Converter.

40 Years of Proof!

BROAD BROOK COMPANY.
WOOLENS & WORSTEDS.

Broad Brook, Conn. Oct. 19 1904

Sirs. Will you send me particulars of your rolling doors, including the cost of doors, installing them etc. We want a couple of doors which would be suitable for our boiler room and we would like to know if rolling doors would be durable in such a place and how they would stand snow and ice in the winter. The doors would have to be opened and closed a dozen times a day. The doorways are 10 feet wide by 10 feet high.

Yours truly
Benj S Hanson. Engineer
Box 221
Broad Brook Ct.

1904

BROAD BROOK COMPANY

Kinnear Manufacturing Co., Inc.,
80 Rockefeller Plaza,
New York 20, New York.

Attention: Mr. Boyd Cherry, Secretary

Gentlemen:

Thank you for sending us the letter which we wrote you October 19, 1904 signed by Benjamin S. Hanson, engineer.

You will be interested to know that Mr. Hanson is still with us. He was pleased to see this evidence of the good judgment he used in buying the rolling doors from you at that time. These doors are opened and closed a dozen times a day and have been in continuous use in all kinds of weather for the past thirty-nine years. The maintenance cost has been nil. After the installation of the few repair parts we have just ordered, the doors should be good for another thirty-nine years of service. They have certainly proved to be a splendid investment.

Very truly yours,
BROAD BROOK COMPANY
Chester A. Wiese
Chester A. Wiese

CAW:S
c.c. to Mr. W. W. Cossum,
Columbus, Ohio.

AFTER 40 YEARS

Benj. S. Hanson, Engineer at the Broad Brook Company who instigated the original purchase of the Kinnear Door in 1904, is also still on the job!

40 years of daily service . . . maintenance costs nil . . . and still delivering highest efficiency! 40 years of savings in floor and wall space . . . of extra protection against fire, theft, wind and weather! Here again is dramatic proof of how ruggedness and economy are combined with smooth time-saving convenience in Kinnear Rolling Doors. Many similar records in the Kinnear files tell of such long, low-cost efficiency. The *coiling upward action* of the famous interlocking-steel-slat construction (originated by Kinnear), plus skilled engineering and fabrication by door specialists, are the reasons for the remarkable performance of Kinnear Rolling Doors. They are the right answer to every service door problem!

The KINNEAR MANUFACTURING Co.
Factories:
2020-40 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.

Check These Kinnear Rolling Door Advantages!

Convenient upward action plus heavy-duty steel construction.

Coil compactly above the opening—saving floor and wall space.

Effectively counterbalanced for smooth, fast, easy operation.

All-metal protection against riot, theft, intrusion, fire.

Open out of reach of damage by vehicles, wind, or elements.

Specially treated, rust-resistant materials—weatherproof, more durable.

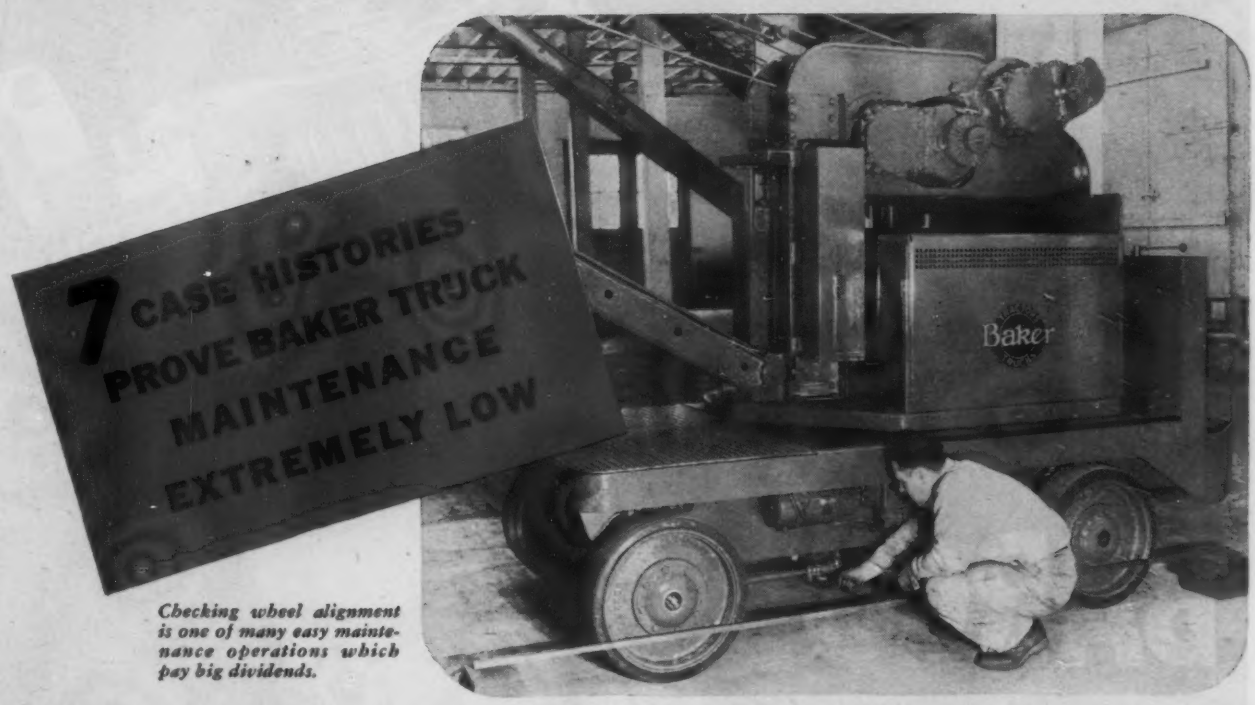
Built to exactly fit the opening—easy and economical to install.

Easily adapted for convenient, time-saving motor operation.

SAVING WAYS IN DOORWAYS...

KINNEAR ROLLING DOORS

How much are You paying
FOR INDUSTRIAL TRUCK MAINTENANCE?



Checking wheel alignment is one of many easy maintenance operations which pay big dividends.

COMPARE *Your Costs* WITH THESE:

The rugged construction of Baker Trucks, and the easy accessibility of all parts requiring service, result in unusually low maintenance costs. The following actual records are typical of many where regular inspection and lubrication are a matter of routine.

A midwestern railroad paid a total of $144.70 for replacement parts for two Baker trucks which were in continuous service over a period of 7 years, 4 months—an average of only 82c per month per truck.

A large motor truck manufacturer with a fleet of Baker Trucks, reports that during the last 5 years the total maintenance expense, on a truck purchased 26 years ago, exclusive of tires, has not exceeded $50.00 per year.

A large aircraft parts manufacturer bought 11 Baker Trucks 3 years ago for his huge new plant. Trucks operate 24 hours a day under most severe conditions. During the last 12 months (3 years of normal service) maintenance costs averaged $350.00 per truck—a remarkable record considering that they had seen the equivalent of 9 years of gruelling, uninterrupted service.

A wire mill reports that their Baker Truck, purchased in 1918 is still in regular service, and that maintenance cost—exclusive of tires—has been less than $50.00 per year for the last 5 years.

A food canner using a Baker Hy-Lift Truck purchased in 1931, writes: "Our superintendent tells us that surprising as it may seem, no new parts are necessary. Your representative told us what adjustments could be made—and it seems that they could do it right at the cannery. It looks like this is just one more blue ribbon for Baker. It is amazing that after all these years a general replacement of essential parts is unnecessary."

A brass fitting manufacturer reports that his 4 Baker Trucks, in continuous service for 3 to 5 years have required no overhaul—and factory replacement parts, exclusive of tires, have averaged about $10.00 per year per truck.

A Baker Truck operating nearly four years in the plant of a transportation equipment manufacturer, has needed no major overhaul. Maintenance costs, in spite of severe service conditions, have totaled only $150.91—less than $40.00 per year.

To help you reduce maintenance costs on your industrial trucks, write for "Industrial Truck Care Pays You Dividends."

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2172 West 25th Street • Cleveland, Ohio
In Canada—Railway & Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

BARCO
TYTAMPERS

for smoother roadbeds

Efficient maintenance of right-of-ways reduces wear and tear on vital and currently irreplaceable rolling stock. In this all-important service, Barco Unit Tytampers are invaluable . . . helping overcome labor shortages, handling dozens of different jobs quickly, capably and economically. Investigate these famous tools.

BARCO UNIT TYTAMPERS

THE FREE ENTERPRISE SYSTEM IS THE SALVATION OF AMERICAN BUSINESS

BARCO MANUFACTURING COMPANY, NOT INC., 1800 Winnemac Ave., Chicago 40, Ill. • In Canada: The Holden Co., Ltd., Montreal, Can.

WINTER KINGS

have licked the problem of keeping switches open

1 Compact overall dimensions: 18 in. long, 4½ in. wide, 7½ in. high, including flanges.

2 Flanges at burner end protect ties from the flame.

3 Sliding cover facilitates heat regulation.

4 Fuel opening is protected by self-closing cap. Heater can safely be filled while flame is burning.

Bethlehem's Winter King Switch Heater is the ounce of prevention. But its value is greater than the biggest pound of cure you ever tried.

This simple, compact, and inexpensive heater fights snow as it falls and thereby keeps switches open. Since it's always on the job, it's a 'round-the-clock guardian of your switch points — eliminating freeze-ups far more effectively than manual methods.

Filling is so easy that one man can handle a large number of Winter Kings.

The Winter King burns low-cost kerosene. Its 1½-gal. fuel chamber holds sufficient oil for 9 to 15 hours of burning, depending upon the severity of the storm. Four heaters to a side are usually recommended on 16½-ft. switches. The amount of heat can be regulated by a cover that slides easily over the combustion chamber.

If you haven't yet tried the Winter King, ask a Bethlehem man for full details. He'll be glad to show you why thousands of these economical heaters have proved so effective in New York, Philadelphia, Boston, Buffalo, Chicago, St. Louis, and other areas where Old Man Winter is an annual hazard.

Order your Winter Kings now for summer and early fall delivery—so you'll be ready for next year's early snowstorms.

BETHLEHEM STEEL COMPANY

BETHLEHEM, PA.

★ ★ BETHLEHEM STEEL ★ ★

ONE HUNDRED BILLION BUGS TURN UP TOES!

U. S. Navy Orders 40 Carloads of Insecticide Judged "Essential" as Health Insurance for Armed Forces!

Bowser Can Filling Unit Fills 450 1-Gallon Cans Every Hour!

* * *

When a large eastern chemical manufacturer received an order from the Navy for 40 carloads of insecticide (320,000 gallons) an acute problem arose. How could they fill 320,000 1-gallon cans quickly in order to meet delivery dates? Prompt delivery was vitally important as the insecticide was to be used to destroy all types of vermin aboard ship and on shore.

The problem of high speed filling was solved quickly when this company installed a Bowser can filling unit equipped with a temperature and specific gravity adjustment dial. Thus Bowser equipment met all rigid Navy specifications which demanded that every can be filled according to weight. With this equipment and in spite of the small size of the can openings, inexperienced girls were able to fill better than **450 1-gallon cans an hour!** This same Bowser Equipment has also been used for filling 5-gallon benzol cans and 1-gallon cans of Xylol and Xylene—also delivered in carload lots.

This is just one phase of Bowser Liquid Control. Railroads, too, benefit from the use of Bowser equipment. Most American and Canadian railroads use Bowser fueling systems to fuel their fleets of gas and Diesel electric locomotives. Chief reason is time-saving. A Bowser unit delivers 800 to 850 gallons or more in four to five minutes. In addition a Bowser Recording Printer Meter provides up to eight copies of the delivery report. All automatic. A Bowser engineer will gladly consult with you. Write today: BOWSER, INC., Dept. 38-C, Fort Wayne 2, Indiana.

Not only has Bowser's war production earned the Army-Navy E... Bowser equipment has helped earn it for scores of other companies.

THE NAME THAT MEANS **EXACT CONTROL** OF LIQUIDS

BOWSER

SINCE 1885

RAILWAY WEEDS

Advanced 1945 Technique for their Control

BYSULOX *Kills Weeds*

The Bysulox Method of railway weed control combines the latest advances in the science of chemical weed killing with a simplified, economical method of application. Unlike earlier single-action weed killers, the Bysulox Method now provides two highly functionalized liquid chemical compounds, Bysulox A and Bysulox C, which are used to produce the most complete results possible.

General Chemical Company is prepared to supply spray train equipment and experienced operators for the application of the Bysulox Method for chemical control of railway weeds.

The improved operating methods and advanced chemical techniques of our 1945 program will add materially to previous standards of weed control. Investigate this unique method by writing for free folder.

ILLUSTRATED FOLDER FREE

The Bysulox Method of chemical control for railway weeds is fully explained in this new folder. Diagrammatic drawings show the simplicity and unusual advantages of the Bysulox Spray Train arrangement. See for yourself how the Bysulox Method eliminates messy mixing . . . saves time, cost, equipment and manpower. Just fill out coupon below and mail today. No obligation!

Write Today!

A Research Development of

GENERAL CHEMICAL COMPANY
WEED KILLER DIVISION
40 Rector Street, New York 6, N. Y.

GENERAL CHEMICAL COMPANY

GENERAL CHEMICAL CO., *Weed Killer Division*, 40 Rector St., New York 6, N. Y.

Please send your free, illustrated folder explaining the Bysulox Method for chemical control of railway weeds to:

Name.....

Railroad.....

Position.....

Street.....

City.....

Zone.....

State.....

RA-3

World's fastest and most accurate communications system

NOW BEING ADAPTED FOR TRANSPORTATION

Illustration shows a Telefax (Finch Facsimile) message as sent by the War Advertising Council. Facsimile will be used for the instant and accurate transmission of written, unmistakable orders and reports, and for other communications where high speed and complete accuracy are desired.

By means of Finch Facsimile, any message that can be written, printed or illustrated on paper can be transmitted as far and as fast as electric circuits reach by wire or radio.

A sheet 8½" x 11" can be transmitted in two minutes, which can contain many hundred words, plus photographs and drawings!

This is a speed of electric transmission never before equalled. And the accuracy is absolute. Furthermore, the definition is finer than newspaper halftones. And the cost is reasonable.

Begin using Finch Facsimile in a limited area and expand as desired. Include Facsimile in your postwar planning.

FINCH TELECOMMUNICATIONS, INC. • PASSAIC, N. J.

Automatically synchronizing

finch facsimile

On new construction work or relaying of old rail, follow up with IMPROVED HIPOWER SPRING WASHERS for the final touch of safety

IMPROVED HIPOWERS

IMPROVE TRACK

THE NATIONAL LOCK WASHER COMPANY, NEWARK, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

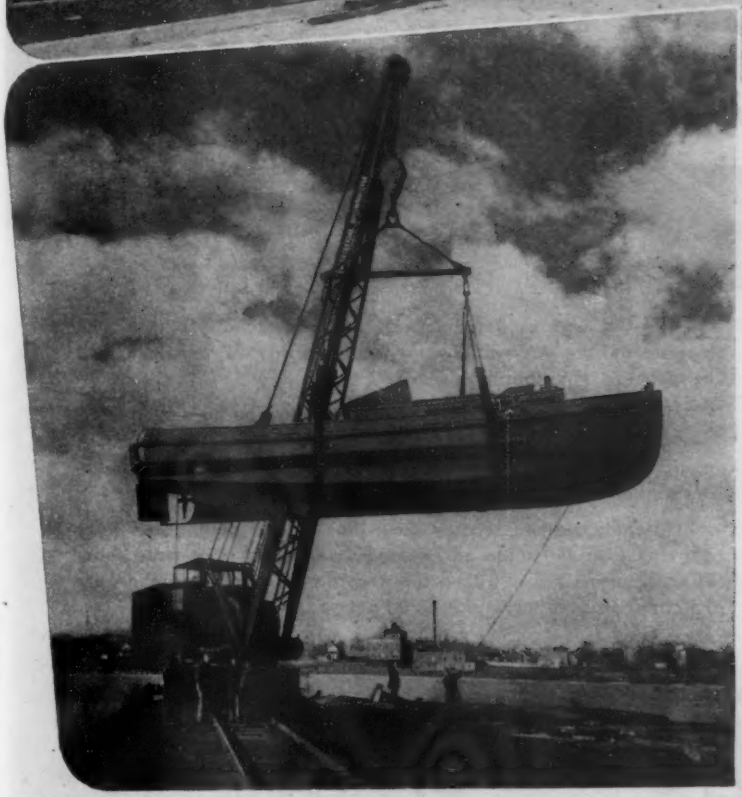
HOW TO END JOINT MAINTENANCE

Thermit welding ends all rail joint maintenance problems by converting jointed track into continuous rail. This modern time-tested welding method is used for long stretches of open track, and for platform track, grade crossings and other short lengths where track maintenance is difficult. In tunnels, where severe corrosive conditions cause excessive joint maintenance, Thermit welding of rail joints has proven to be of special value.

The Thermit welding process requires only simple equipment. A short training period under a Metal and Thermit supervisor fits your own crew to do the work. The Thermit reaction produces rail-quality weld metal that forms a strong, permanent joint, with a minimum of internal stresses. Write for full details to Metal & Thermit Corporation, 120 Broadway, New York 5, N. Y., Albany, Chicago, Pittsburgh, So. San Francisco, Toronto, Ont.

Thermit Welding

MATERIALS MOVE FAST when I. B. equipment is on the job



At coal and ore docks, in shipyards, in industrial plants, on railroads—at almost every link in America's sprawling industrial chain, Industrial Brownhoist equipment is doing a speedy, superior job of handling practically every type of material. Because they're properly designed and built to last—I. B. cranes and bridges and car dumpers and pile drivers can put in long, continuous hours of hard service to meet the demands of heavy production schedules. Typical of I. B. engineering and construction superiority is the 4-5 Ton Traveling Bridge, pictured above, which unloads and stores coal from boats at a large eastern power plant. Left: I. B. Diesel locomotive cranes may be found hard at work with magnet, hook, or bucket, nearly the world over. Patented Monitor-type cab provides 360° visibility and better ventilation. Regardless of your material handling problems, get the facts from I. B.

INDUSTRIAL BROWNHOIST BUILDS BETTER CRANES

INDUSTRIAL BROWNHOIST CORP • BAY CITY, MICH. • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago • Agencies: Detroit, Birmingham, Houston, Denver, Los Angeles, San Francisco, Seattle, Vancouver, B.C., Winnipeg, Canadian Brownhoist Ltd., Montreal, Quebec.

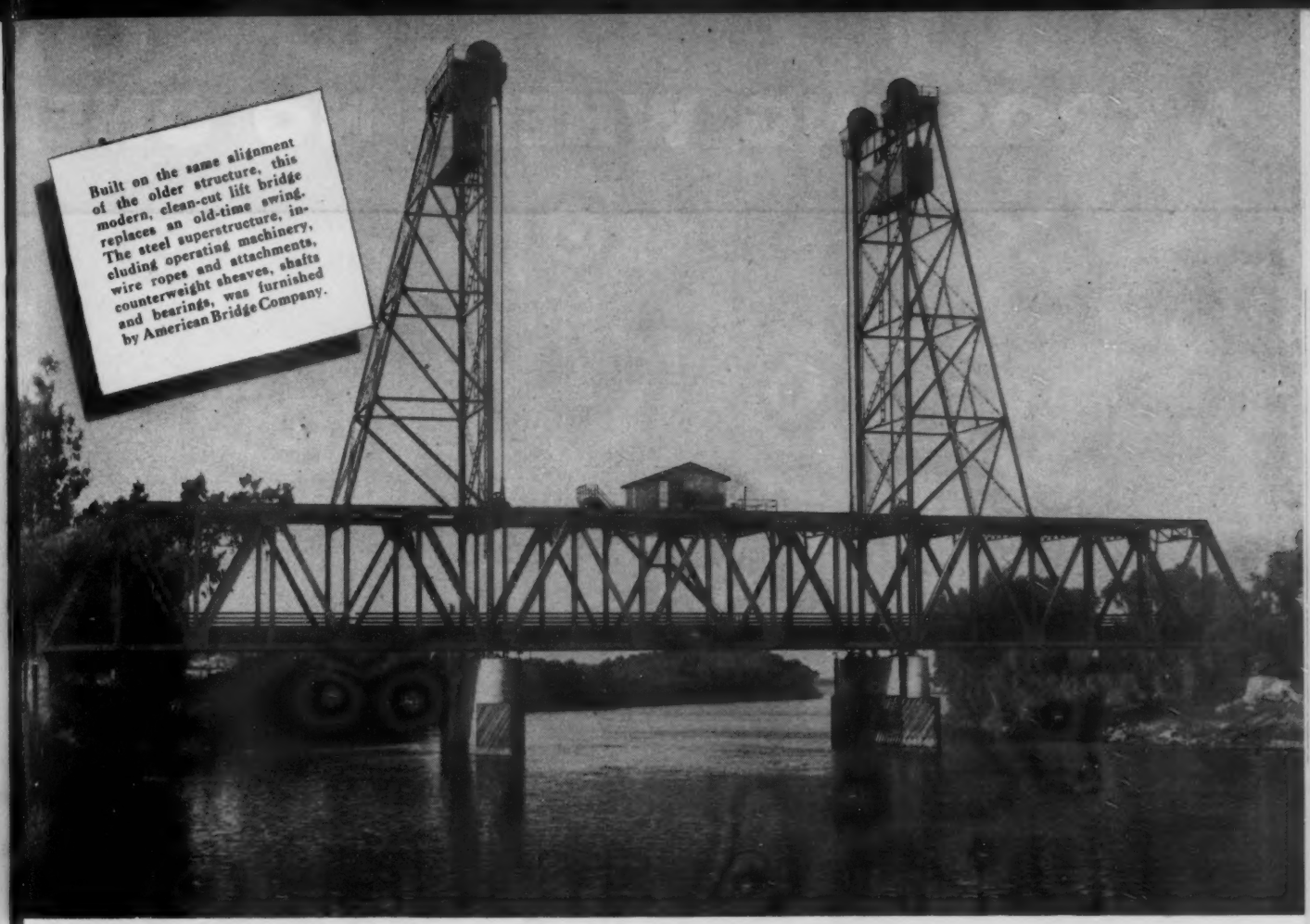
Speed of weighing was a "must" for the cars in this picture. But the day will come when economy of weighing will be far more important than speed.

When either demand . . . or both . . . must be met, a Streeter-Amet Automatic Weight Recorder will solve the problem. With S-A equipment, cars roll over the scale at the rate of 4 or 5 per minute. Weights are automatically, accurately and legibly recorded.

Carefully verified records show that a road putting 100 cars per day over the scale can save $23.00 per day or more than $8,000 per year . . . with a S-A recorder. A road weighing only 15 cars can save more than $700 per year.

Now is the time to plan for economy of future operations. Ask for a Streeter-Amet engineer to make a complimentary survey of your weighing problem and submit recommendations. Remember, an experienced field man supervises every S-A installation and keeps the machine in first class operating condition while in use.

STREETER-AMET COMPANY
4109 North Ravenswood Avenue • Chicago 13, Illinois


Built on the same alignment of the older structure, this modern, clean-cut lift bridge replaces an old-time swing. The steel superstructure, including operating machinery, wire ropes and attachments, counterweight sheaves, shafts and bearings, was furnished by American Bridge Company.

BRIDGES FOR TOMORROW

ELIMINATION of transportation bottlenecks on strategic railroads is exemplified by this modern, double-track lift bridge which replaces an old-time swing.

The "old-timer," built 50 years ago, rendered yeoman service in the years of lighter roadbed loadings and slower train speeds. Within its limited capabilities it performed faithfully, even within the early period of the war emergency. But its light construction, its slow-operating swing span, and its single-track in an otherwise double-tracked system, handicapped train movements with slow speed restrictions.

The new, double-track structure, with a fast operating lift span, eliminates slow-speed orders and reduces navigation interruptions to a minimum. Engineered to the requirements of today's heavy power, traffic density and high speed operations, it embodies design and construction elements that contribute to great permanence, low maintenance costs and sound operating economies.

Modern bridge structures such as this point the way to the coming job of roadbed rehabilitation because postwar competition will demand a continuance of the outstanding service rendered by America's railroads during the war.

When peace comes, American Bridge, too, will be able to put aside its war job. Then, with vastly greater facilities, resources and experience, we will be fully prepared to meet every structural need of the nation's railroads.

AMERICAN BRIDGE COMPANY

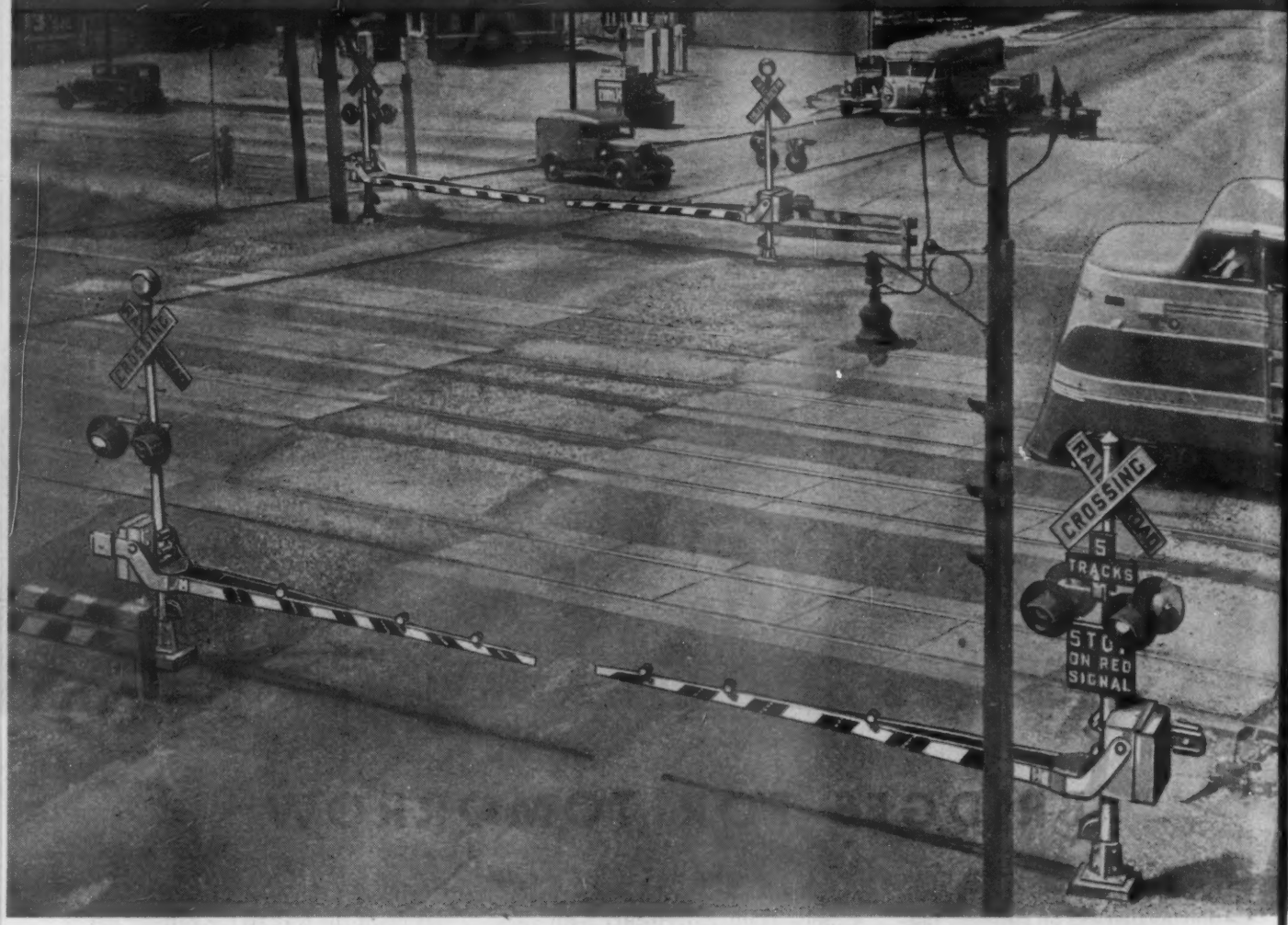
General Offices: Frick Building, Pittsburgh, Pa.

District Offices in: Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit
Duluth · Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* United States Steel Export Company, New York

UNITED STATES STEEL

A CROSSING WHERE NO ONE H



PROTECTING life and property is the obligation and job of MODEL 10 Highway Crossing Signals. That they are performing their duty well is evidenced by the fact that of the 3,206* accidents that occurred in 1943 at the intersection of railroad tracks and highways NOT ONE OF THESE ACCIDENTS HAPPENED WHERE MODEL 10 HIGHWAY CROSSING SIGNALS ARE INSTALLED.

Such performance is indeed outstanding — to the public for the lives that have been saved, and to the railroads in the elimination of costly delays and traffic interruptions.

The sound engineering principles on which Model 10 Signals are built is the basis for their commendable performance.

*Information secured from Interstate Commerce Commission.

WESTERN RAILROAD S

2330-60 S. ASHLAND AVENUE CH

HAS DIED SINCE 1937

It's Protected with

Model 10
HIGHWAY CROSSING SIGNAL

MODEL 10 SIGNALS

- Block Traffic in Approach Lanes Only
- Make Vehicles Come to a Full Stop
- Cannot Trap Vehicles on Tracks
- Safeguard Against Second Train
- Operate Automatically 24 Hours per Day on the Closed Circuit Principle
- Eliminate the Human Element

THE MODERN, ECONOMICAL CROSSING SIGNAL TO PROTECT LIFE AND PROPERTY

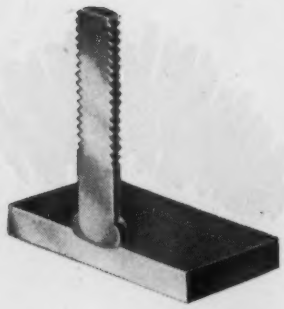
U.S. Patent Nos. 2,137,196 and 2,362,710
Patent in Canada June 27, 1939

SUPPLY CO.

CHICAGO 8, ILLINOIS

Studs end-welded in ½ second with the Nelson Stud Welder!

NELSON MODEL "H"
STUD WELDER

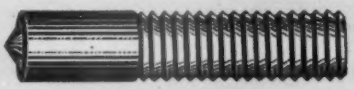
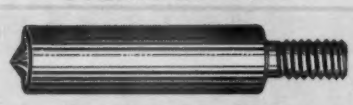
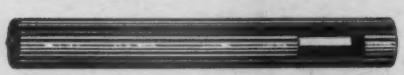


Cutaway view shows complete fusion between stud and metal . . . in ½ second. For strength, accuracy, and time-saving no other means of securing studs can approach this method.

Light in weight—completely portable, the Nelson Stud Welder is ideal for welding in any position. All Nelson Studs are used with the one gun, by simply interchanging chucks. Multi-gun units are available for production-line uses.

Easy operation makes the Nelson Stud Welder a versatile tool in the hand of any operator, experienced welder or not. 500 to 1500 studs can be welded by one operator per shift because it is simple and completely automatic.

TYPES AND SIZES OF NELSON STUDS

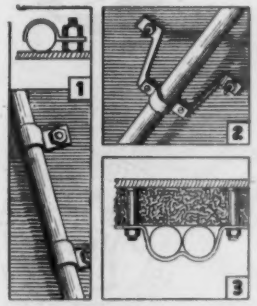
 STRAIGHT STUD	Diameters from 3/16" to ½". Threaded or blank. Lengths from 1" to 8".
 SHOULDER STUD	Diameters: 7/16" & ½". Lengths: Shoulder from ½" to 7"; extension from ¾" to 1¼".
 LAGGING STUD	Made to specifications. Lengths of 1", 2", 3" and 4". Diameter of ⅜".
METAL LATH STUD	Lengths of 1", 2" and 3", for various thickness of insulation. Diameter 3/16".

BENT STUDS, DRIVE SCREW STUDS, SPECIAL LENGTHS AND OTHER SPECIALTIES • *Write for complete details, or send us specifications and let us show how stud welding can help you.*

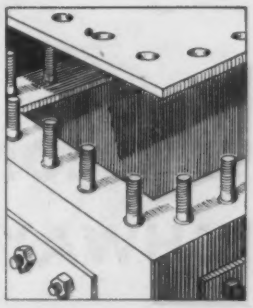
NELSON Electric Arc

A FEW RAILROAD APPLICATIONS FOR THE NELSON STUD WELDER

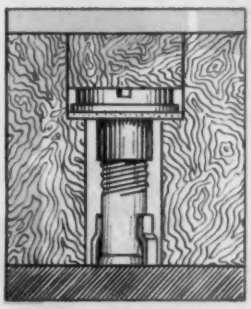
—more than 520 industrial plants and shipyards use it!



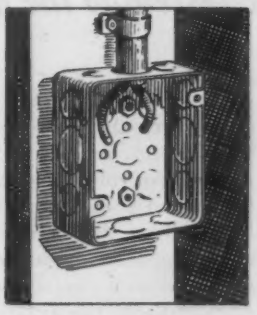
Wiring, conduit, and pipe are quickly secured. Here illustrated are a few methods: 1. Securing conduit. 2. Securing pipe (single and multiple runs). 3. Securing wiring of all kinds over soft insulation materials.



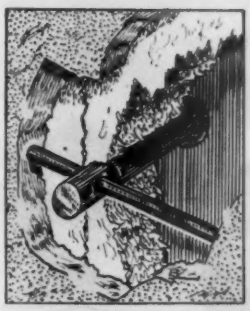
Inspection covers of all types can be secured with Nelson Studs. No drilling holes through casings, or hand welding studs. Studs are automatically welded in less than ½ second. No leaking or loosening.



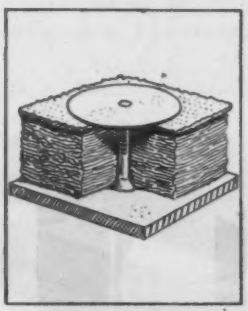
Metal boxes is secured over metal beams with studs. The flooring is laid, and holes drilled where desired. Studs are welded through the holes and nuts and washers tightened down. A wooden plug is then tapped in to complete the job.



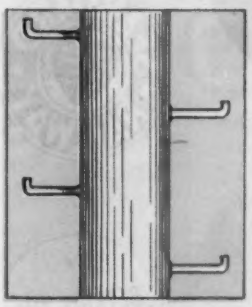
Electrical equipment of all kinds, outlet boxes, circuit breakers, etc., can be secured without drilling metal to secure them or welding on small pads. Accurate locating is easy because all Nelson Studs are pointed.



Lagging studs secure magnesia and other materials for insulation purposes. The stud is welded, and a wire slipped through the stud holes. The blocks of insulation are then placed under the wire and the wire pulled tight. Covering is then added. The hole may be located where desired on the stud. Studs also used to secure storm curtains in locomotive cabs.



Studding boiler tubes can be used to secure soft insulation rapidly and securely. They are welded directly through the material without injury to it. Where large metal surfaces must be insulated these pins will save both time and material.



Bent studs for use as steps, etc., are available in several lengths. They are furnished bent and welded directly to metal. Wherever there is need for hooks or steps on metal frames, Nelson Studs of this type may be used with speed, economy, and assure through its welded strength great safety.

For general maintenance of all kinds the Nelson welder is excellent. It will end-weld studs to metal for any kind of repairs. For securing oil lines with straps; for inspection and ventilator covers; air lines; car repair; and for general work of all kinds around the shop.

FREE CATALOG AND SAMPLES

Complete details about how the 520 industrial plants and shipyards are making use of this stud welder may be obtained at once. ***Write to:***

NELSON SPECIALTY
WELDING EQUIPMENT CORPORATION
Dept. RA, 440 Peralta Ave., San Leandro, Calif.

Eastern Representative: Camden Stud Welding Corp., Dept. 122, 1416 South Sixth St., Camden, N. J.

STUD WELDER

DETROIT & TOLEDO

DETROIT TERMINAL

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Truscon Weltrus Steel Crossings provide a permanent crossing combining strength, durability and economy, with extreme simplicity of design. Weltrus track sections are made of rolled steel channels, ribbed at the side with the section ends completely closed. The center reinforcing bar web, sides and ends, are electrically welded into a homogeneous unit. Instead of the armoring being anchored into the concrete, the concrete is actually anchored into the armoring, thus eliminating all possibility of the armoring loosening and causing the disintegration of the concrete.

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Truscon construction engineers will gladly give you complete information on Weltrus Crossings for your postwar projects.

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. . . and good for many thousand miles of COLORFUL ADVERTISING!

THE advertising value of color is well-known to Great Northern officials and many other progressive railway executives. But lengthy layups of rolling stock in paint and maintenance shops cannot be tolerated today. That's why more than one railroad is turning to Pittsburgh Carhide in Color—the twenty-four-hour-finish.

● ● In addition to its remarkable ease of application and quick drying qualities, Carhide provides a glass-smooth, extra-durable surface that stays *live,* tough and elastic—resists cracking and peeling caused by extremes of temperatures—gives *live-paint protection* at lower cost per-year-of-service. Moreover, Carhide in Color retains its brilliant gloss and readily withstands repeated washings and scrubbings.

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● ● Expert advisory service is offered to users of Pittsburgh Industrial Finishes. Our extensive experience in the field can often save you time and money.

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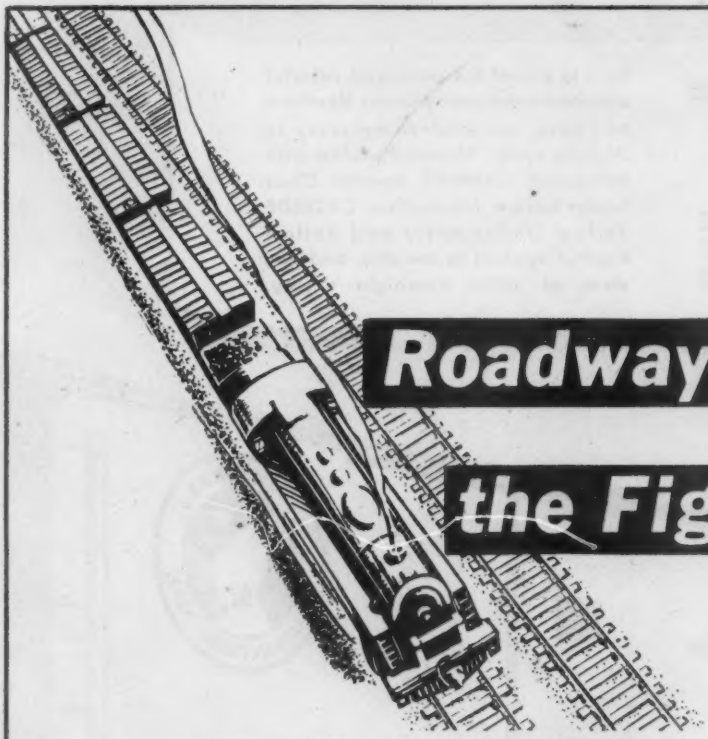
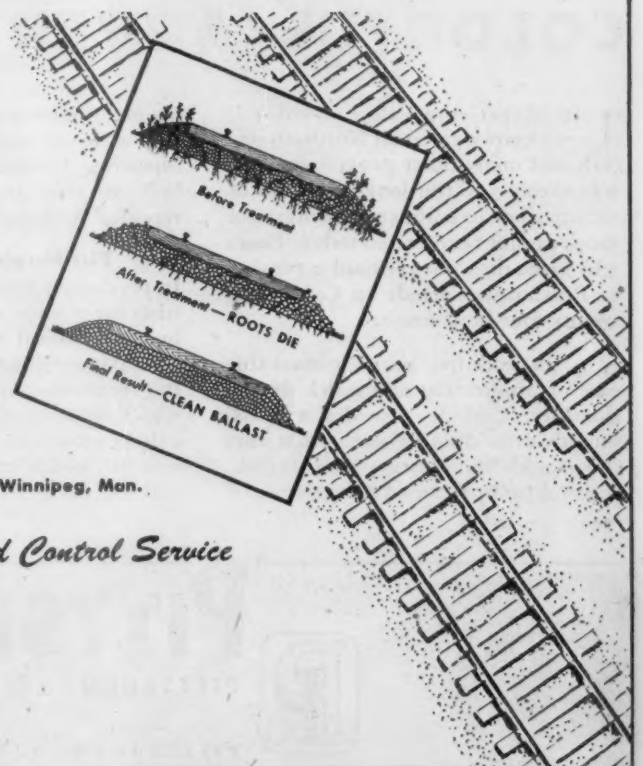


Roadways Leading to the Fighting Fronts

Down these vital roadways flows an endless stream of trains whose burden of fighting men and material is the very life blood of our war effort.

To you maintenance men who are keeping these roadways in such excellent condition, all credit is due. Your unceasing efforts are surmounting all difficulties. Every possible means of conserving manpower is required, and we are proud to contribute towards this accomplishment.

Today, our Atlacide and Atlas "A" Weed Killers are being used throughout the United States and Canada. This fact speaks for itself!



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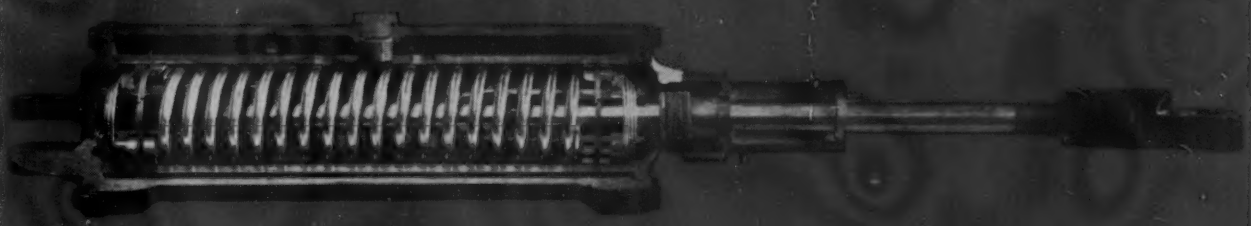
Over Twenty-five Years of Weed Control Service

MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

The Pettibone Mulliken MECHANICAL SWITCHMAN



Spring Switch Mechanism

economics of spring switches

SIGNAL SECTION A.R.A.
Com. 1 — Economics of Railway Signaling
March 1934—Pages 34-6

TIME SAVED PER TRAIN STOP

The time saved per train stop eliminated at a spring switch location will vary with the train load, grade and other local conditions. The average time saved on 164 installations hereinafter referred to was 7 minutes per train while a saving of 10-15 minutes may occur under less favorable operating conditions.

ECONOMIC ADVANTAGES OF SPRING SWITCHES WITHOUT FACING POINT LOCKS

1 On the M. P. an installation of three spring switches was made on a Wye at Hot Springs, Ark., at a total cost of $4,700. Approximately 2,000 trains turn on this wye through the spring switches in a year, so that figuring the time saved in eliminating stops, plus saving in wear and tear on equipment and in labor, an estimated total saving of $11,400 per year was reported, or 243% on the investment.

2 Railroad "A"—A spring switch at the end of double-track showed an annual saving of $5,361, due to the time saved by passenger and freight trains by eliminating stops for a hand-thrown switch. The time saving was based on 4 min. for passenger and 10 min. for freight trains.

3 Railroad "B"—A spring switch at the end of yard lead in automatic signal territory was installed at a first cost of $400, thereby permitting the closing of a block office at an annual saving of $4,500.

4 Railroad "C"—A spring switch replaced a hand-thrown switch at the end of double-track, in automatic signal territory, at a cost of $1,029 and resulted in an estimated annual saving of $8,160.

5 One road with 42 installations: 9 at end of double-track, 16 on sidings, and 17 at other points, reports the elimination of 74,277 train stops per year resulting in saving of $58,367. The total cost of installation was $11,262 and, after deducting all charges, the net saving per year was $56,559, or about 500 per cent on the investment.

6 A road installed one spring switch at end of double-track eliminating 2,920 train stops per year at a saving in wages of $617 and a total saving of $4,738. The annual charges were $274 per year, leaving a net saving of $4,464. The cost of this installation was $1,985 due to adding two one arm signals operated by track circuits.

REMOTE CONTROL AND SPRING SWITCHES

The Central of Georgia (Signal Section, A.R.A. 1931 Proceedings, Vol. XXIX, pp. 23-25) installed 3 spring switches and 1 power switch on 2 crossovers near Americus, Georgia, at a junction point where 2 single-track lines merge to form a double-track. The total cost of the installation was $10,829 and the net savings per year was $6,174, or 57 per cent on the total cost after all charges.

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Quality Since 1880

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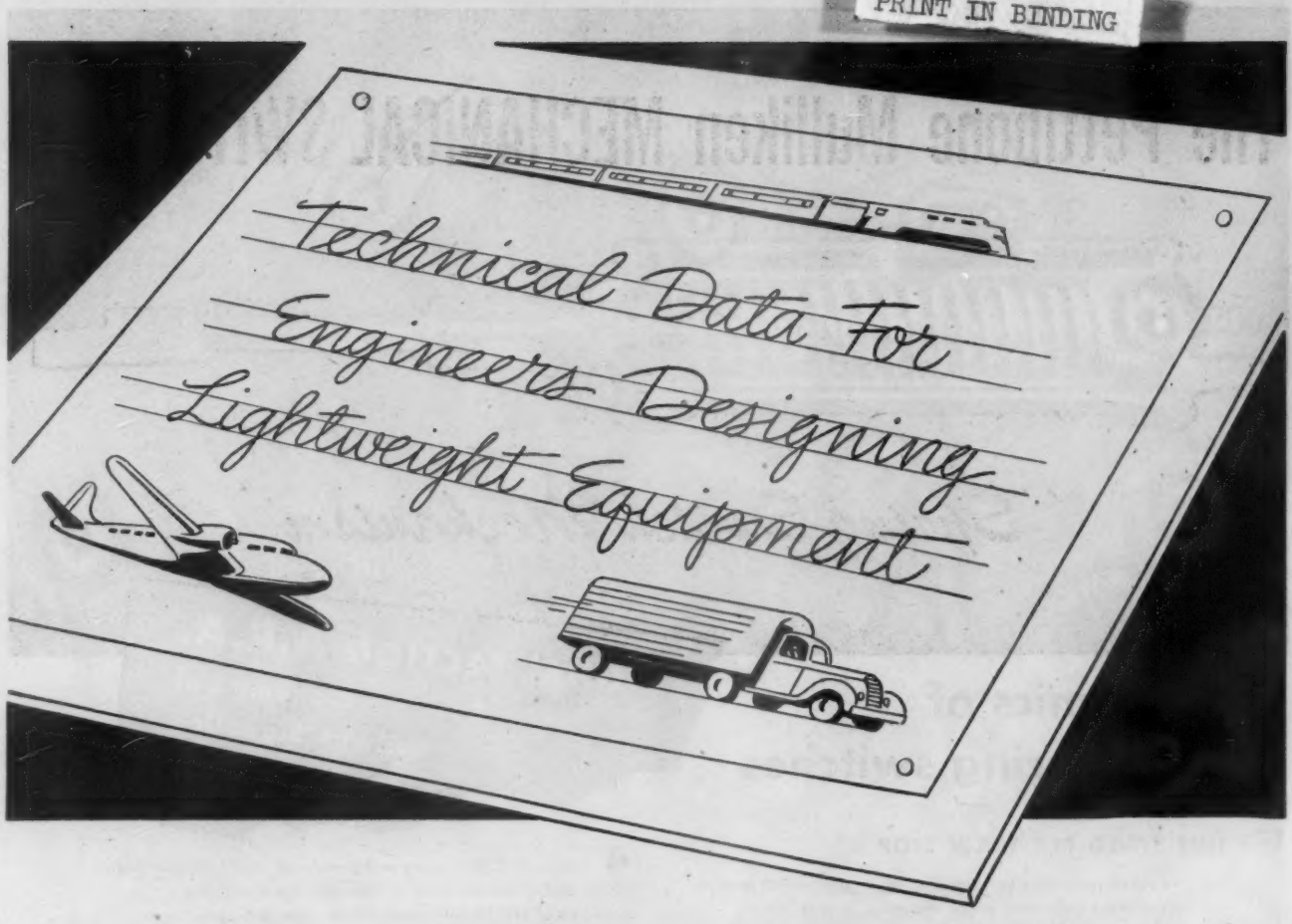

• You can get much useful information on the physical properties of the high-strength cold-rolled austenitic alloy steels by writing for the technical publications listed below.

All these papers are based on studies made at the research laboratories of Electro Metallurgical Company, and are part of a broad development program to find new or improved ways of using stainless and other alloy steels and irons.

Buy United States War Bonds and Stamps

"The Stress-Strain Characteristics of Cold-Rolled Austenitic Stainless Steels in Compression as Determined by the Cylinder Test Method" — describes a method for determining compressive strength of thin sheets of these steels; it is illustrated by curves from the tests on typical grades of stainless steel.

"Effects of Low-Temperature Heat-Treatment on Elastic Properties of Cold-Rolled Austenitic Stainless Steels" — a 16-page paper, illustrated by charts and graphs, on the results of various low-temperature heat-treatments on the mechanical properties of cold-rolled austenitic stainless steels.

"High-Manganese Austenitic Steels" — physical data on new high-strength steel, for possible use in aircraft construction and in other lightweight structures.

"Tension and Compression Stress-Strain Characteristics of Cold-Rolled Austenitic Chromium-Nickel and Chromium-Manganese-Nickel Stainless Steels" — a compilation of important physical data on austenitic chromium-nickel and chromium-manganese-nickel steels.

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How TOURNAPULLS help relocate 23 miles of ROCK ISLAND track

When you plan for tomorrow's faster, heavier traffic, try this job-proved method of cutting construction time and costs

Elimination of steep grades and sharp curves requires relocation of approximately 23 miles of the Rock Island main line, between Harlee and Eldon, Iowa. Peter Kewit Sons Co. of Omaha, Nebraska, is using six Super C Tournapulls to help move the 2,300,000 yards of earth involved. This new route will eliminate three miles of track; the new roadbed will permit laying of heavier rails.

Move more dirt cheaper

New railroad construction like this Rock Island job, can be handled cheaper and faster with Tournapulls . . . they weigh less, have more power and travel at higher average speeds than overweight, slow-moving, crawler-type equipment. Self-contained Tournapulls operate off-track . . . no time lost switching to sidings, no interruption of vital revenue trains. With Tournapulls you make 50 to 60 minutes of every work hour productive.

One pusher easily handles three or four Tournapulls, depending on length of haul. Note how Tournapull loading keeps cut and banks smooth, practically eliminates extra finishing costs.

Investigate benefits

To get your earthmoving handled quickly and at less cost, join the alert railroads who are letting grading jobs to Tournapull contractors, equipping their maintenance crews with fast, modern, money-saving, LeTourneau rigs. Write TODAY for engineering council from our experienced field engineers and for illustrated folder on Tournapulls.

RR2

Tournapulls are quickly pusher loaded. One pusher easily handles three or four Tournapulls, depending on length of haul. Note how Tournapull loading keeps cuts and banks smooth, practically eliminates extra finishing costs.

Tournapulls are Versatile

Tournapulls can save you time and money on such railroad construction and maintenance work as:

1. New grade construction.
2. Curve relocation and grade reduction.
3. Strengthen and widen banks and slopes.
4. Dig and clean drainage ditches.
5. Grade for new sidings, spur and passing tracks.
6. Reinforce roadbeds.
7. Remove slides, fill-in and repair washouts.
8. Coal handling and stockpiling.

Fast moving, off-track Tournapulls load, haul and spread in one operation . . . no big, expensive loading unit or special spreading tools needed. Saves on equipment investment, requires fewer men.

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Manufacturers of Tournapulls®, Angledozers®, Bulldozers, Tiltdozers®, Carryall® Scrapers, Power Control Units, Rooters®, Tournatrailers, Tournacranes®, Tournatrucks®, Sheep's Foot Rollers, Tournarods®, Tournaweld®, Tournalifts®.

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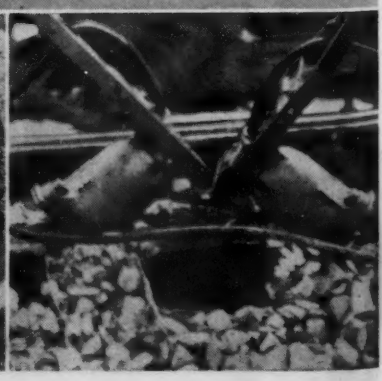
Jackson UNIVERSAL Tampers

The capacity of the JACKSON Universal Tamper to perform specific tamping operations under all conditions justifies its recognition as THE Universal tie tamper.

1 JACKSON ***vibratory*** Tampers are Universal because of their general use on the country's leading railroads.

2 JACKSON ***vibratory*** Tampers are Universal because they operate in all ballasts, in high or low lifts, surfacing or spotting.

3 JACKSON ***vibratory*** Tampers are Universal in applications such as digging out water pockets, cleaning old ballast and ice removal.



The interchangeable blade feature is aptly demonstrated in the illustrations, which show the Universal use of JACKSON Tampers in any kind of ballast. For every job there is a JACKSON-Made tamper blade, whether it be ballast insertion, surfacing, spotting or skeletonizing.

Write for information regarding the use and ease of operation of the Tamper and the various applications of the interchangeable blades.

ELECTRIC TAMPER & EQUIPMENT CO.
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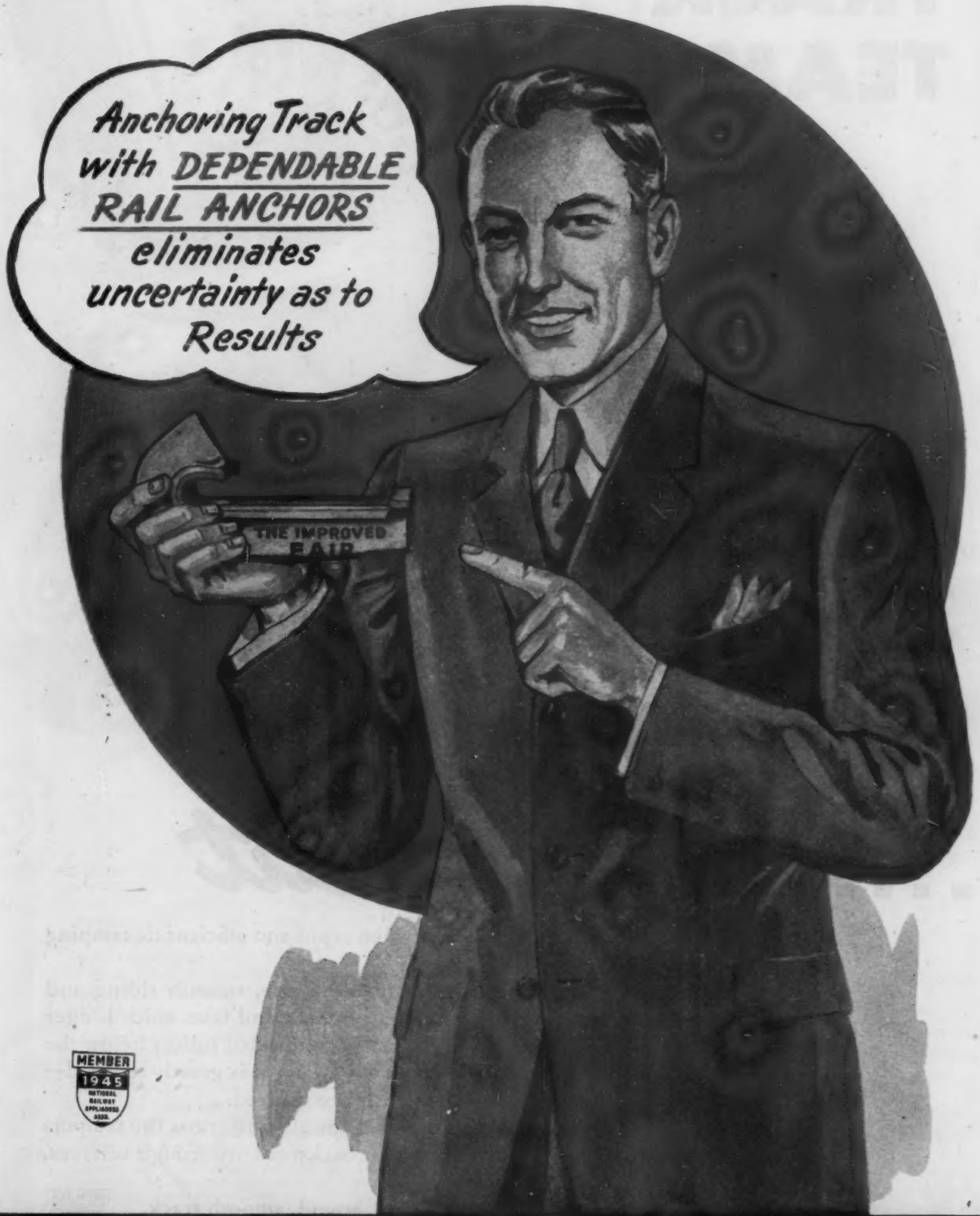
Mr. Maintenance Official



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The Air Powered MT-3 tie tampers insure a safe, smooth riding and uniformly tamped track which keeps its alignment and lasts much longer under heavy traffic. The reasons are—ballast is compacted solidly below the ties—water pockets are eliminated—track work fatigue is greatly reduced—all this means that lower maintenance costs are assured.

The Crawl-Air Compressor that furnishes the air power for the tampers moves right along with the job—forward or backward over rough surfaces. It can climb grades up to 40%.

Put this team to work if you want good, sound, smooth track.

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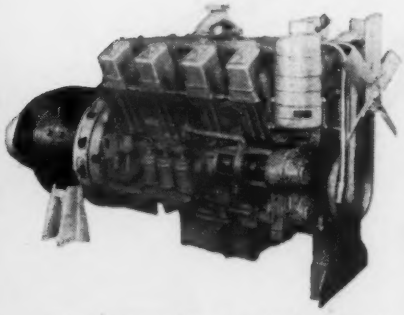
LOCOMOTIVE'S EFFICIENCY "SCARES" RAIL OFFICIAL



• Two "Caterpillar" Diesel D17000 Engines like this, direct connected to generators, power the General Electric locomotive shown here. "Caterpillar" Diesels also power most of the other 44-tonners (roughly 84%) in operation in the Western Hemisphere. Some "secrets" of these engines' long life, high availability, low maintenance and low operating costs are:

- Correct design, precision manufacture and highest quality materials.
- No operating adjustments; and no hand-fitting of replacement parts.
- Injection valves and individually replaceable injection pumps are interchangeable; installed without timing, balancing or other delicate adjustments.
- Absorbent filters assure positive protection against dirt and grit reaching injection pumps and valves.
- No fouling or choking up while idling. Pre-combustion chamber of exclusive design provides efficient burning of a wide range of fuels at all loads and speeds.

THIS novel news "scarehead" might well be evolved from General Manager R. I. Cartwright's comment on the performance of the "Caterpillar"-Diesel-powered 44-tonner which has taken over *all* the traffic and switching work of the Arcade & Attica's 28-mile line and two terminal yards.

"Sometimes it scares me," said Mr. Cartwright. "It is operating almost *too* well . . . you know we haven't done anything to that locomotive for over 42 months, and it runs 8½ hours a day six days a week."

Even though more than 8500 operating hours have already been recorded, so much reliance is placed upon this locomotive's availability that the road's standby — a 100-ton steam locomotive — hasn't been fired up for 22 months.

Nor do winter snows tie up the line, as they once did — for days! For this 44-tonner hasn't been stuck yet . . . it shoves the plow through the heaviest drifts — and has often made regular trips in four feet of snow *without* plow.

"Bull-dog" tenacity in staying with the job is characteristic of locomotives powered with "Caterpillar" Diesels. Their records on 37 large and small roads bear witness to that. *WRITE* for further facts and figures.

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CATERPILLAR DIESEL ENGINES

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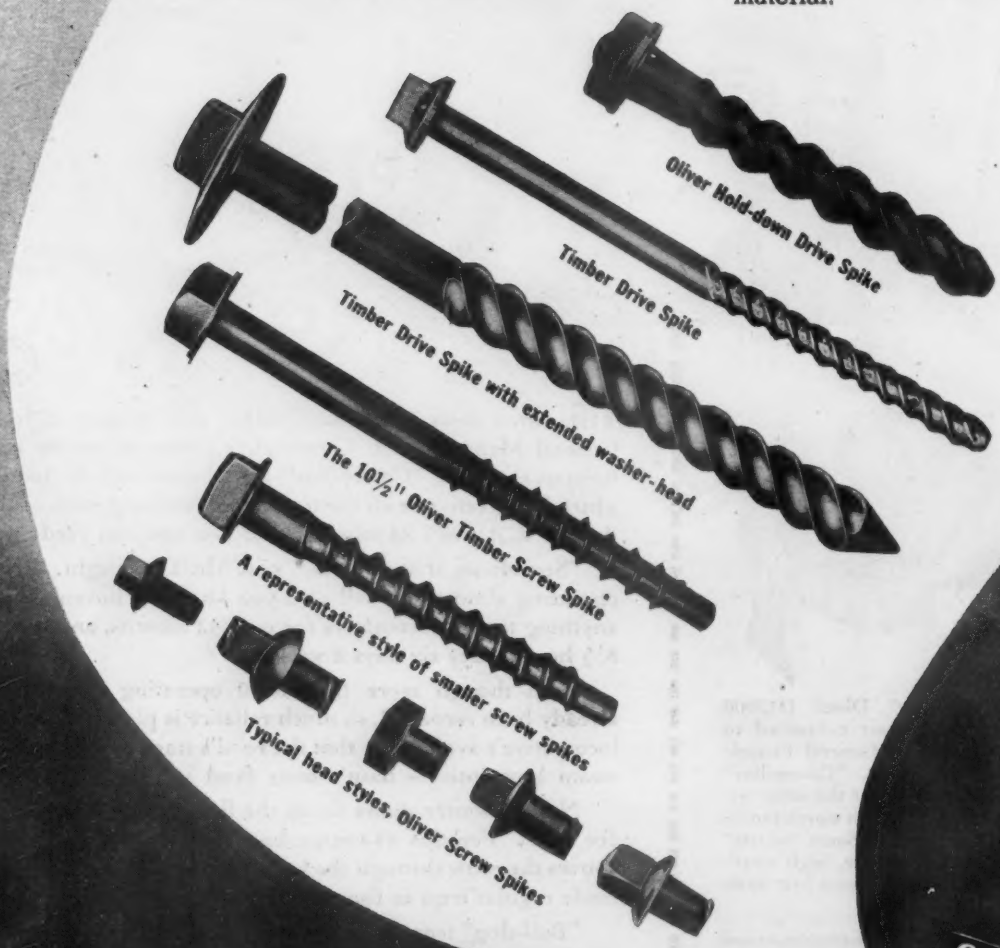
SCREW and DRIVE SPIKES

For Railroad Structures

The complete line of Oliver Railroad Fasteners includes Screw and Drive Spikes in a variety of styles and sizes as needed for railroad work. Some of these are illustrated below. Note the quality features that mean greater satisfaction—integral washers, clean threads, pilot-points, tough, high-strength material.


Oliver Hold-down Drive Spike
Timber Drive Spike
Timber Drive Spike with extended washer-head
The 10½" Oliver Timber Screw Spike
A representative style of smaller screw spikes
Typical head styles, Oliver Screw Spikes

OLIVER

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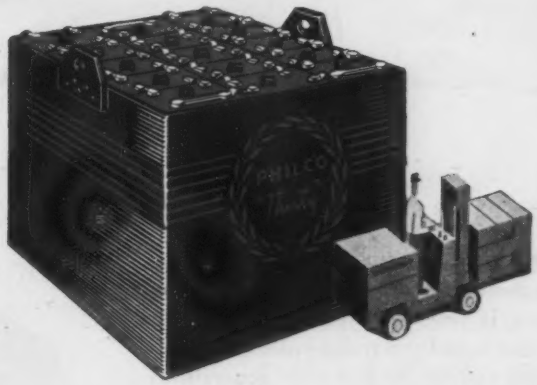
SOUTH TENTH AND MURIEL STREETS · PITTSBURGH, PENNSYLVANIA

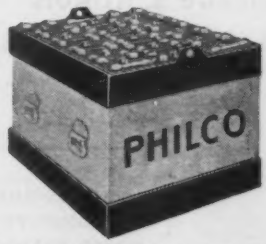
LET PHILCO REDUCE YOUR MATERIAL HANDLING COSTS

Philco is ready, *today,* with the advanced high-capacity battery performance and long-life economy you'll need in your post-war operations. The complete Philco post-war line includes modern Storage Batteries for all motive power and stationary needs. It will save you dollars in depreciation, up-keep and maintenance costs to specify Philco. Let us send you the latest Philco Battery catalogs of types for your special requirements. Philco Corporation, Storage Battery Division, Trenton 7, N. J.



THE NEW PHILCO "THIRTY"—An outstanding post-war product for industrial trucks is the new Philco "Thirty" Storage Battery that gives 30% longer life and is identified by its distinctive red top. Now available in preferred types.

Philco Motorized Hand-Lift Truck Battery



Typical Philco Electric Industrial Truck Battery in Steel Tray

Specify PHILCO STORAGE BATTERIES

For 30 years a leader in Industrial Storage Battery Development

Equipment That Helps the Railroads

"Keep Things Moving"

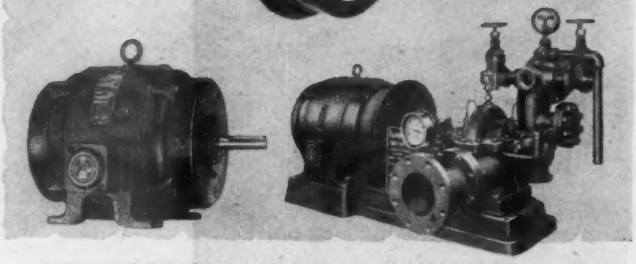
FAIRBANKS-MORSE SHEFFIELD MOTOR CARS

"First on the Rails and Still First."

ALL the nation knows that the railroads are doing an amazing job these days, despite severe handicaps. Fairbanks-Morse is proud to serve the railroads with products that help keep trains rolling . . . with behind-the-scenes equipment that four generations of railroad men have known for its dependability.

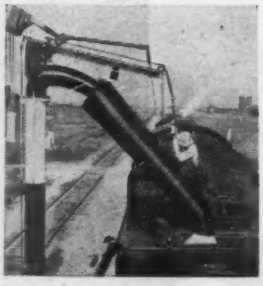
FAIRBANKS, MORSE & CO.
FAIRBANKS-MORSE BUILDING
CHICAGO 5, ILLINOIS

CANADA: CANADIAN FAIRBANKS-MORSE CO., LTD., MONTREAL



FAIRBANKS-MORSE MOTORS AND GENERATORS

FAIRBANKS-MORSE PUMPS—Steam, power, trash, angle-flow, centrifugal, rotary, turbine, and propeller types in all sizes. Centrifugal pump shown.

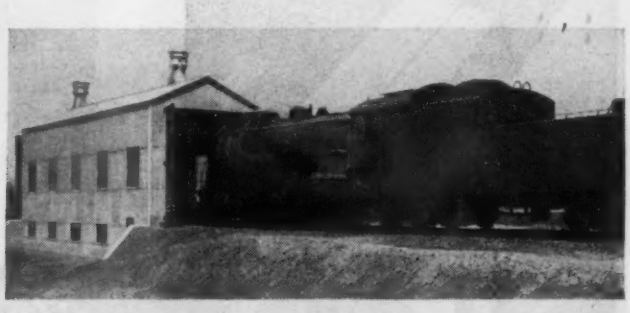


FAIRBANKS-MORSE LOCOMOTIVE WATER CRANES

MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

FAIRBANKS-MORSE SCALES

Everything in weighing equipment from one to one million pounds capacity.



Fairbanks-Morse

A name worth remembering

Diesel Locomotives • Diesel Engines • Generators • Motors • Pumps • Scales • Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment

We want to help you KEEP 'EM ROLLING

Because each day makes it more apparent to the railroad man that each piece of rolling stock is a vital, almost irreplaceable implement of war, he is reaching out for every possible means to "keep 'em rolling".

Since *protective painting* is one of these means, we of Glidden have taken every possible step to give our railroad customers "preferred" treatment . . . to serve them promptly and efficiently.

Among other helps developed specifically for railroads by the Glidden Railroad Technical Service is TWO-A-DAY car painting, which reduces the time equipment must be idle to a new low.

Glidden's long experience in solving special painting problems encountered in railroad operation has equipped our engineers with a vast fund of knowledge which you are free to draw upon at any time.

With eight plants and research laboratories strategically located throughout the country, we are prepared to respond quickly to your request for any kind of technical service. Write us. We are eager to help you.

THE GLIDDEN COMPANY • Cleveland 2, Ohio

TIME-TESTED

TWO-A-DAY
FREIGHT CAR PAINT

Glidden has developed a special freight car paint which can be applied two coats a day. The trick, of course, is quick drying. This TWO-A-DAY paint is helping America's railroads keep 'em rolling. . . to get cars in and out of the shop—fast! It is a real factor in meeting the heavy and urgent demands of war. In addition to its drying speed, Glidden's TWO-A-DAY paint provides great durability, protection, and all other essential properties of an ideal railroad maintenance paint.

GLIDDEN • *Pacemaker in Paints*

LUNDIE
TIE PLATES

USE LUNDIE TIE PLATES

Require 10% Less Steel to Manufacture

MORE than 250,000,000 Lundie Tie Plates placed in service by the railroads is an outstanding recognition that the inclined, stepped seating without tie cutting projections, essentially smooth bottom, will hold the track to gauge eliminating the use of additional spikes such as is required with flat bottom plates. These important features coupled with the fact that Lundie Tie Plates require 10% less steel to manufacture more than justifies their use for conserving critical material for the duration.

MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

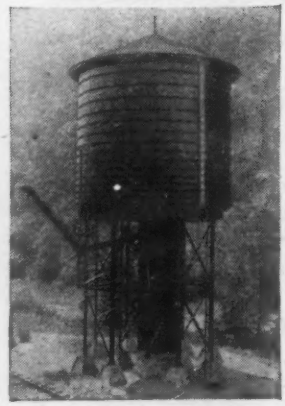
Manufactured to A. R. E. A. Specifications **Furnished in Double or Single Shoulder**

THE LUNDIE ENGINEERING CORPORATION

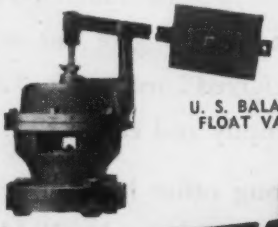
Tie Plates—Spring Rail Clips—Safety Tongs for Handling Track Material—Aladdin Rail and Flange Lubricator

NEW YORK, N. Y. **CHICAGO, ILL.**

1945 *Railroad Equipment*

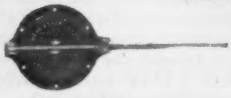


MANSFIELD TYPE "B" WATER COLUMNS
MANSFIELD WATER COLUMNS
U. S. HYDRAULIC VALVE WATER COLUMNS
HALLADAY TANK FIXTURES
HALLADAY OUTLET VALVES
PUMP JACKS
FLOAT VALVES CURTIS PUMPS
WOOD WATER TANKS
WATER HANDLING APPLIANCES
TANK STUFFING BOXES
GENERAL WATER SUPPLY
SWITCH STANDS SEMAPHORES



U. S. BALANCED FLOAT VALVE

U. S. COMBINATION VALVE



HALLADAY OUTLET VALVE

FLOATS (NOT SHOWN) ARE INTEGRAL PART OF VALVE

U. S. ENGINE & PUMP CO.

Division of Batavia Metal Products, Inc.

2100 WILSON ST. • BATAVIA, ILL.

SPECIALIZED SERVICES for the inspection and testing of railroad purchases of materials and equipment.

THE STAMP OF QUALITY
SINCE 1888
HUNT
INSPECTION – TESTS
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RESEARCH

"Hunt" Standard Inspection of Rail and Track Fastenings.

Inspection and Tests of Track Appliances, Ballast Materials, Treated and Untreated Ties, Bridge Timbers and Piling.

Inspection and Tests of Structural Steel, Reinforcing Steel and Cement.

Tests of Materials and Supervision of Construction for Cars and Locomotives.

Supervision of Construction and Field Inspection of Steel and Concrete Structures.

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"Subject to Inspection by ROBERT W. HUNT COMPANY"

ROBERT W. HUNT COMPANY, ENGINEERS

Inspection — Tests — Supervision — Consultation

CEMENT, CONCRETE, CHEMICAL, METALLURGICAL AND PHYSICAL LABORATORIES

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JORDAN

the multiple-purpose machine

Does the work of an army of men!

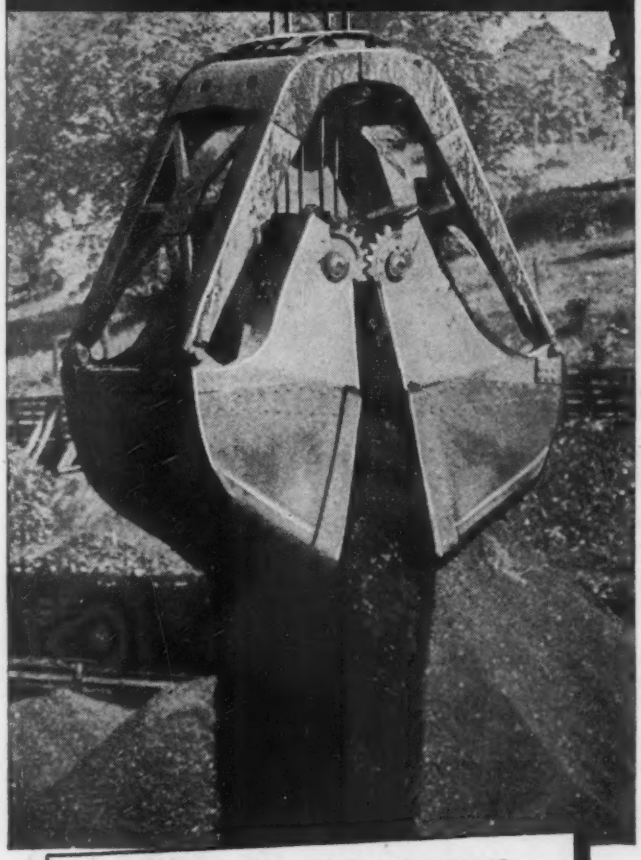
For economical roadbed maintenance, the JORDAN multiple-purpose machine fills the bill. If it's ditching, roadbed shaping, flanging ballast, widening banks, straight wing spreading, plowing and spreading snow, or flanging out ice that your railroad requires, JORDAN does the job better with a minimum of help. JORDAN can easily and quickly be converted for a multitude of jobs, so that it can work four seasons a year.

MEMBER 1945

O. F. JORDAN COMPANY EAST CHICAGO INDIANA

Walter J. Riley, *President*

BLAW-KNOX BUCKETS for LAKE TERMINALS



HANDLING SIX NET TONS OF COAL EVERY THIRTY SECONDS FROM LAKE BOATS

In addition to Size No. G2402 illustrated above, Blaw-Knox manufactures clamshell buckets for all types of railroad applications:

ASH PIT SERVICE
BALLAST RECLAIMING AND DITCHING
COAL HANDLING
LAKE & TIDEWATER TERMINAL SERVICE
REHANDLING, GENERAL PURPOSE
RIVER RAIL TRANSFER SERVICE
HARD DIGGING & DREDGING

BULLETIN 1989

classifies and illustrates Blaw-Knox Buckets for railroads. Your request will bring a copy by return mail.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2061 FARMERS BANK BUILDING, PITTSBURGH, PENNA.

Protect Power Equipment JUSTRITE

Gasoline driven power equipment for laying rails and other maintenance work must be protected against the hazards of fire. Justrite Safety Cans and Oily Waste Cans on the job give you this protection twenty-four hours a day and at a minimum cost.

Safety Gasoline Can

It's specially designed for the safe handling and storing of flammable liquids. A can that's easy to carry, convenient to fill and pour . . . efficient and economical. Approved for safety by Underwriters' Laboratories, Inc. and the Associated Factory Mutual Fire Insurance Companies. These Safety Cans can be had in sizes up to 5 gallons.

Safety Gasoline Can

Oily Waste Can

Oily Waste Can

For shop and section house this is the approved container for oily, dangerous waste and other material that offers an ever present hazard of fire and explosion. It may be had with or without foot lever. The top closes automatically. It meets the same safety approvals as listed above for the Safety Can. Justrite Waste Cans and Safety Cans come in a wide range of sizes. They're standard equipment on many railroads.

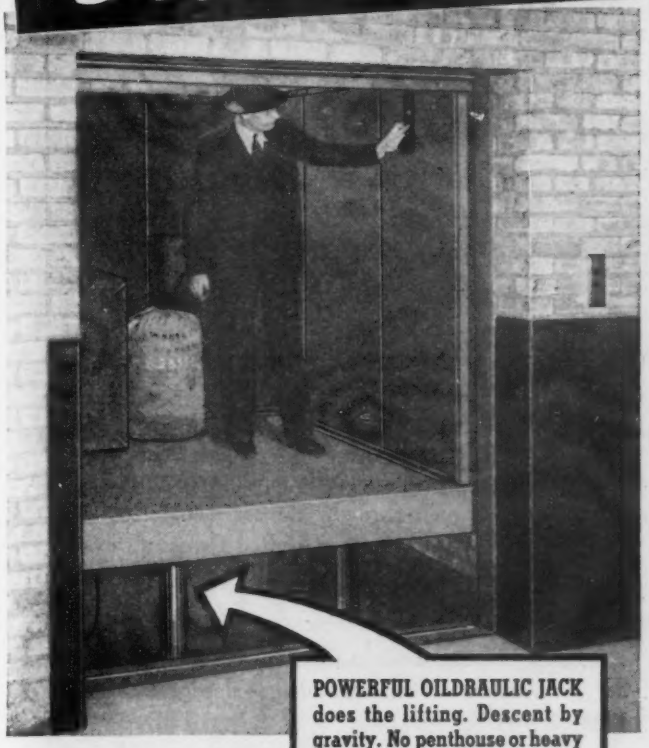
Ask your supplier about the complete line of Justrite Safety Products.

JUSTRITE MANUFACTURING COMPANY
2063 N. Southport Ave., Dept. D-1, Chicago 14, Illinois

JUSTRITE *Safety Products*

SAFETY CANS · FILLING CANS · OILY WASTE CANS
APPROVED SAFETY ELECTRIC LANTERNS

NEED A NEW *Elevator?*



POWERFUL OILDRAULIC JACK does the lifting. Descent by gravity. No penthouse or heavy sidewall structure required.

Then get all the facts on the new Oildraulic Elevator

For two, three or four-story service, an Oildraulic Elevator offers you very definite advantages: First, you save on construction or remodeling costs. Being pushed up from below instead of pulled up from above, no elevator penthouse, heavy sidewall structure or special machine room is required. Second, you can count on an Oildraulic Elevator for smooth operation, accuracy of landing stops, dependability, and safety. All this, in addition to low initial cost and low maintenance expense.

Illinois Central Chooses Oildraulic

The Illinois Central Railroad's new mail facilities elevator, as pictured above, in the Central Station at Chicago, has a rise of 37 ft. and serves 4 landings. This is the third Oildraulic Elevator the Illinois Central has purchased in the past few months.

Oildraulic Elevators are "tailor made" to meet the specific needs of railroads. They are the result of Rotary's experience in building over 40,000 lifting devices during the past twenty years.

Let us send you a free copy of our illustrated booklet on Oildraulic Elevators. Write today for Catalog RE-301.

ROTARY LIFT CO., 1041 KANSAS, MEMPHIS 2, TENN.
Representatives in all key cities, Canada and Mexico

Rotary

OILDRAULIC ELEVATORS

CURVE-RAIL LIFE GOES UP

CURVE-RAIL FRICTION GOES DOWN

Each MECO Lubricator Protects a Number of Curves

with *MECOLUBRICATION*

MECOlubrication prolongs the remaining life of present curve rails 2 to 4 times . . . then stays on the job to double or quadruple the life of new rails. MECO permits higher speeds with safety, increases tonnage ratings up to 10%, reduces curve maintenance costs and derailment hazards.

★

MEMBER 1945 NATIONAL RAILWAY APPLIANCES ASSN.

804

Maintenance Equipment Company
RAILWAY EXCHANGE BUILDING • CHICAGO, ILLINOIS

★

MORCK

SPEED-LINE BRUSHES

FOR HEAVY MAINTENANCE WORK

If it's square feet of fast painting you are after . . . then select Morck's Speed-Line Brushes . . . built to do an extra special job for all industry . . . on the line or for maintenance. "The Choice of Master Painters from the Statue of Liberty to the Golden Gate." Ask your dealer for details on Morck's Speed-Line Brushes.

WRITE FOR INDUSTRIAL CATALOG

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GASOLINE - DIESEL

OHIO LOCOMOTIVE CRANES

STEAM - ELECTRIC

The OHIO LOCOMOTIVE CRANE Co. BUCYRUS OHIO

BUY

WAR BONDS

Keep Your Red Cross at His Side -Give!

THIS is the most important appeal for funds in the history of the American Red Cross.

After three years of war the work of your Red Cross is greater than ever. It must serve millions of our fighting men abroad. Lonely men. Homesick men. Wounded men. The Red Cross, always at their side, helps to bring them cheer and comfort wherever they may be.

It lends a helping hand to the thousands of returning servicemen — sick, wounded — desperately in need of friendly guidance.

And remember, YOU . . and *you* alone . . keep the Red Cross alive. For without your help there could be no Red Cross. There are no special funds to keep up its great humanitarian work. The money must come, as always, from the heart of America — you!

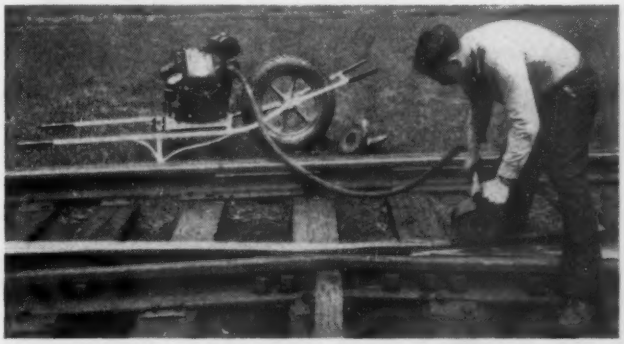
Our duty is clear . . we must keep the Red Cross at the side of our fighting men and our wounded heroes. We must help the Red Cross in its vital job of sending food and medicine to war prisoners . . aiding the ill and lonely overseas . . collecting life-giving blood plasma. The scope of the Red Cross is almost limitless. Every Red Cross worker is your personal messenger of sympathy and comfort to your man in uniform.

GIVE NOW—GIVE MORE

Speed Rail Maintenance in spite of The Manpower Shortage

Railway Track-Work Grinders enable you to maintain rails in the best possible condition, speedily, efficiently, with minimum use of manpower. We make all types of grinders for work on rails, switches, frogs etc.

Write for the latest data bulletins.



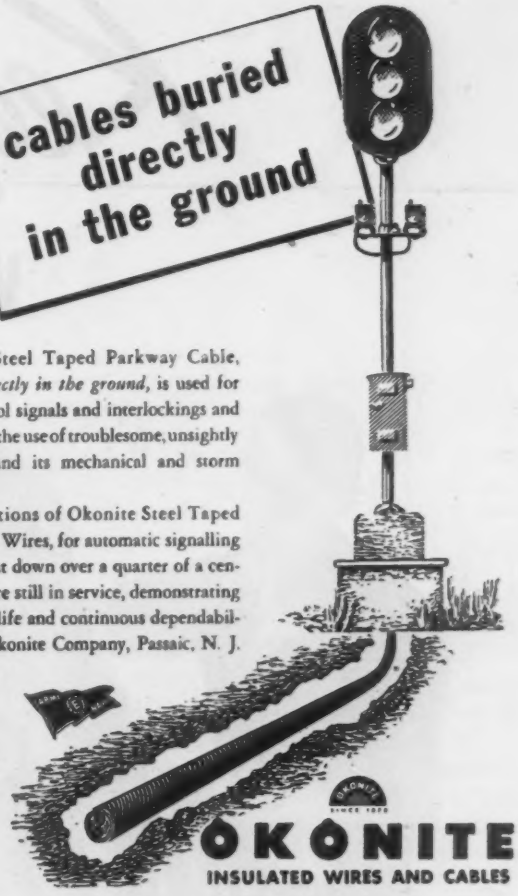
Model P-22 RTW Free-Hand Grinder—one of many models.

Railway Track-work Co.

3207 Kensington Avenue, Philadelphia 34, Pa.

7365

cables buried directly in the ground



Okonite Steel Taped Parkway Cable, *buried directly in the ground,* is used for train control signals and interlockings and eliminates the use of troublesome, unsightly trunking and its mechanical and storm damage.

Installations of Okonite Steel Taped Cables and Wires, for automatic signalling systems, put down over a quarter of a century ago, are still in service, demonstrating their long life and continuous dependability. The Okonite Company, Passaic, N. J.

3715

OKONITE
INSULATED WIRES AND CABLES

SEALTITE HOOK BOLT

1 Fins prevent turning.
2 Fins seat without side pressure.
3 Drives easily.
4 Same size hole makes better installation.
5 Washer nut stops seepage and locks through nail hole.
6 Has reinforced hook.
7 Hook angle furnished to fit job.

***Double Life* SEALTITE HOOK BOLTS**

Because railroad trestles and bridges are constantly exposed to corrosive conditions we recommend the economy of ordering your hook bolts in the Sealtite Double-Life Hot-Dip galvanized finish sealing the bolt in zinc which retards all corrosion and saves expense of frequent replacement.

LEWIS BOLT & NUT CO.
504 Malcolm Ave. S. E., Minneapolis, Minn.

A *Greatly Improved* FASTENER

HOW TO HANDLE SCRAP *Faster*

KRANE KAR picks up a load, transports, and positions it. No need to maneuver the vehicle . . . swing the "live" boom from side to side or raise and lower it by power with full load on the magnet. For loading and unloading scrap at freight cars, handling bulky items around the yards, working at the scrap piles. Easy operation, safety features, stability, and speed enable Railroads to do the job with reduced manpower.

USERS: AT&SF, B&O, C&O, CB&Q, CMStP&P, CRRNJ, D&H, GN, GTW, IC, MP, CP, NYC, RF&P, SP, UP, CV

Agents in the Principal Cities

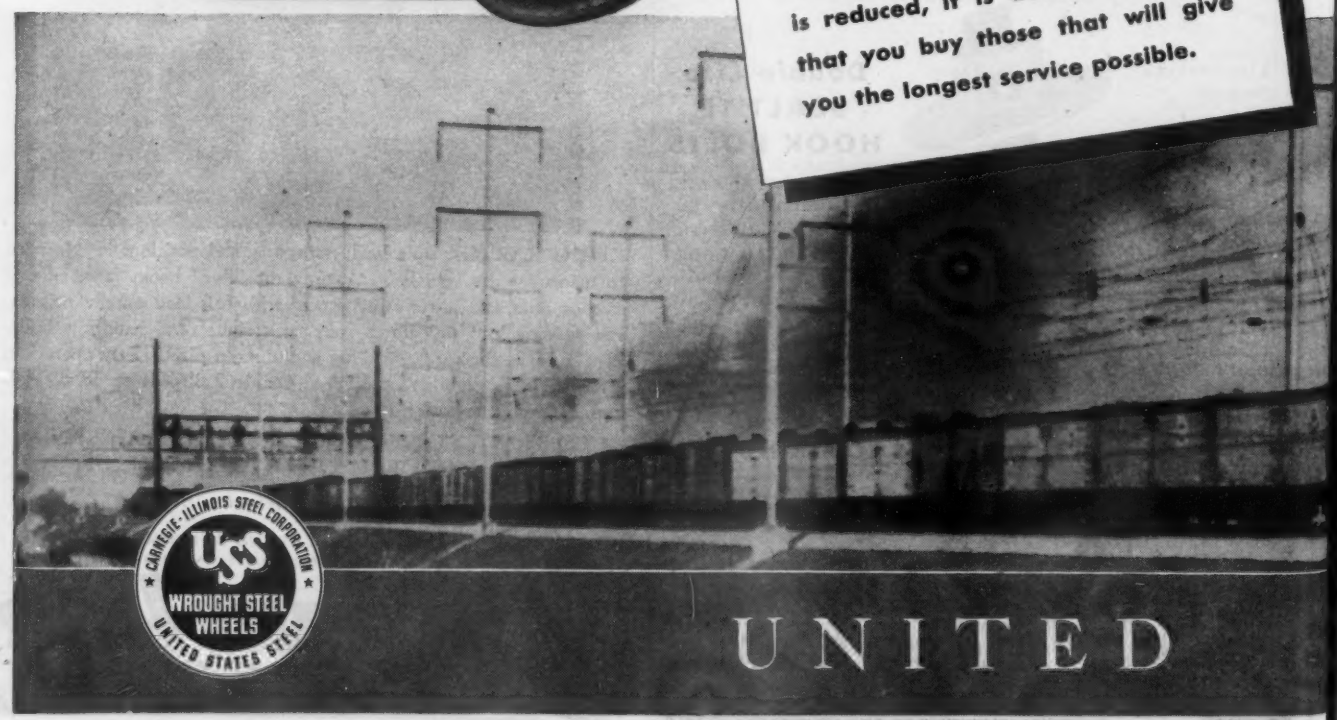
THE ORIGINAL SWING BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

KRANE KAR
FOR RAILROADS
SILENT HOIST & CRANE CO., 847 63RD ST., BROOKLYN 20, N.Y.

Keep Supplies

WITH U·S·S ONE-WEAR

For economic reasons alone, high mileage in freight wheels has always been highly desirable. Today, when the available supply of wheels is reduced, it is doubly important that you buy those that will give you the longest service possible.



UNITED

Rolling . . .

WROUGHT STEEL WHEELS

THE necessity of squeezing every last mile out of heavily burdened freight cars emphasizes the advantages of U·S·S One-Wear Wrought Steel Wheels. For safety, long-lasting service and low cost, these wheels are unexcelled.

Greater Safety

Carrying heavy loads at high speeds under wartime conditions demands the best equipment. Wherever One-Wear Wrought Steel Wheels have been adopted, derailments and delays due to wheel failure have been sharply reduced. Because they can endure heavy brake action and impact at high speeds, their safety factor is high.

Better Service

Freight cars laid up for wheel changes are not only not producing revenue—they are consuming precious time and money. U·S·S One-Wear Wrought Steel Wheels add thousands of mile-hours to a freight car's productive life before it must go to the repair track.

Lower Cost

On the basis of cost per thousand miles, U·S·S One-Wear Wrought Steel Wheels average substantially less than the cost of freight car wheels of other materials.

On 91 railroads and 68 private lines there are nearly 2,000,000 One-Wear Wrought Steel Wheels in service. Their record merits close attention. Under 50/55-ton service, they average 200,000 miles. Under 70-ton service, 160,000 miles. Many have gone well over 300,000 miles. A few have topped the 400,000 mile mark.

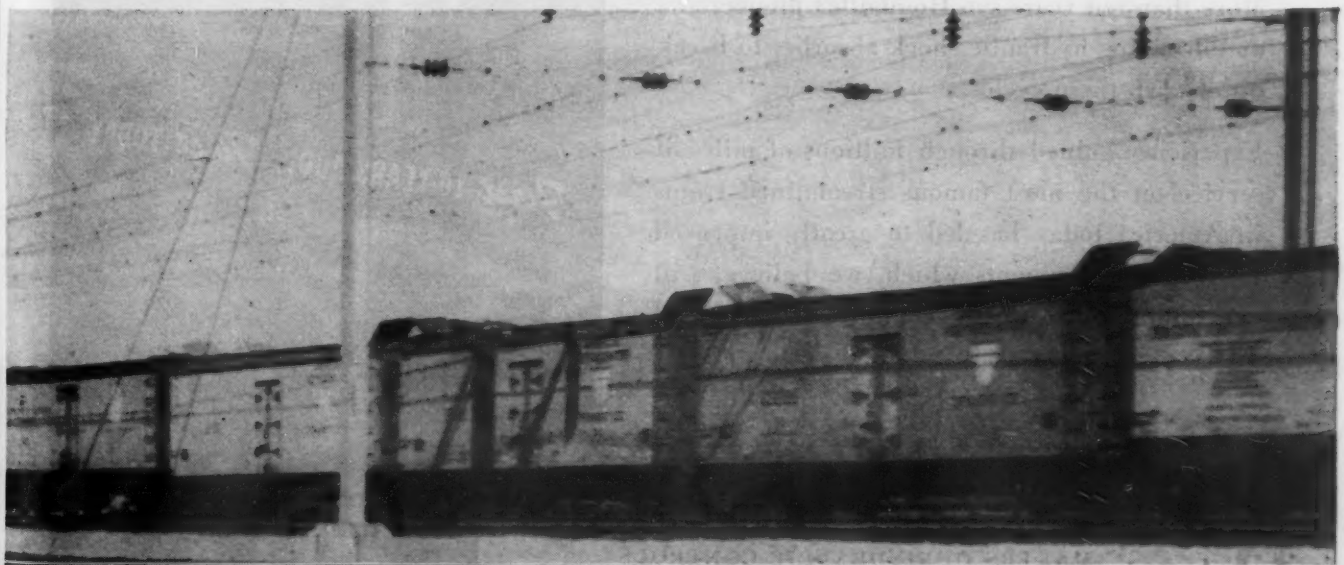
In the most exacting freight service—where loads are heavy and speeds are high—One-Wear Wrought Steel Wheels have proved that they insure incomparably greater safety, fewer traffic interruptions, and cost less to run per mile.

To keep supplies moving now and to prepare for strenuous postwar competition, change over to U·S·S One-Wear Wrought Steel Wheels.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York



STATES STEEL

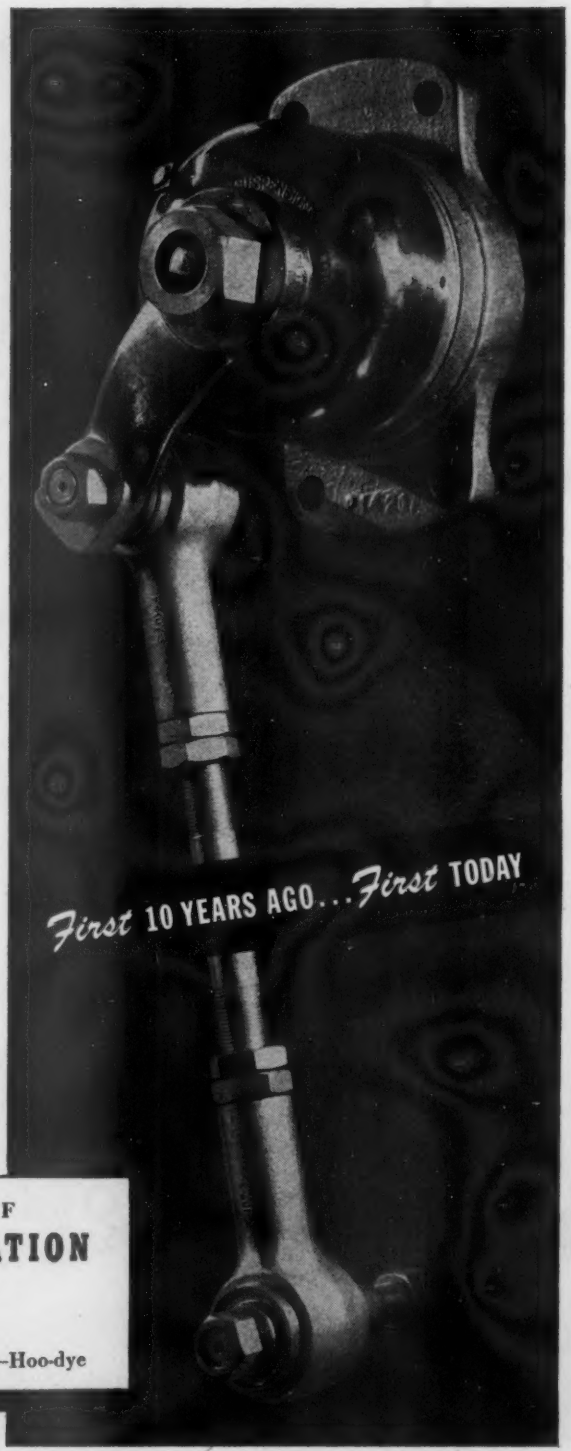
Route Step

. . . break it up, men!

Soldiers, according to tradition, broke step when crossing old-time bridges. Periodic vibration amplified by marching feet, it was feared, would cause a collapse of the structure.

Railroading has its vibration problems, too . . . particularly with high-speed trains. As engineers well know, cycles of vertical or lateral oscillation synchronize into violent forces at certain speeds. More than ten years ago Houdaille* pioneered a double-acting hydraulic shock absorber to break up or curb these cycles.

Experience gained through millions of miles of service on the most famous streamlined trains in America today has led to greatly improved Houdaille instruments which, we believe, will contribute much to the comfort, stability and safety of post-war trains.



HOUDE ENGINEERING DIVISION OF

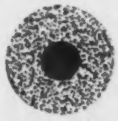
HOUDAILLE-HERSHEY CORPORATION

MAKERS OF HYDRAULIC CONTROLS

Buffalo 11, New York

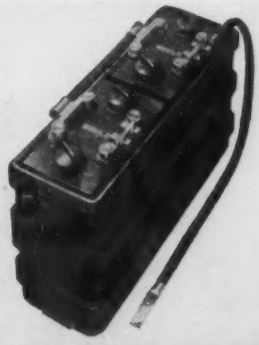
*Pronounced—Hoo-dye

KATHANODE POSITIVE GRID with its box-type pockets and reinforcing bar.



BLACK OXIDE active material with its core of pure lead.

GLASSKLAD spun glass retainer mat pioneered in America by Gould.



KATHANODE GLASSKLAD

Distinctive in Design . . .
Outstanding in Performance

Gould research and Gould's half century of battery experience are responsible for these exclusive features: (1) The Kathanode grid for long life and high conductivity. (2) Black Oxide active material for sustained capacity. (3) Glassklad protection to minimize power loss.

These features are the heart of your battery, and assure sustained power throughout a long battery life. *Only when you buy a Gould Kathanode do you get these distinctive features pioneered by Gould.* For 20 years *"Glassklad"*, developed by Gould for its Kathanode battery, has meant long life and outstanding performance.

Write Dept. 53 for Catalog 800 on Gould Kathanode Glassklad Batteries for Carlighting and Air-Conditioning Service.

GOULD

SINCE 1898...THE BATTERY PICKED BY ENGINEERS

ARMY (E) NAVY

FOR EXCELLENCE IN STORAGE BATTERY PRODUCTION AT DEPEW PLANT

GOULD STORAGE BATTERY CORPORATION, Depew, New York. Los Angeles • North Bergen • Rockford • St. Paul • Sioux City • Zanesville

It's LOBSTER NEWBURG at Chicago's famous Edgewater Beach Hotel. As served in the beautiful Marine Dining Room, this piquant dish is a never-failing delight to guests who appreciate fine food.

"SPECIALTY OF THE HOUSE"... IN NAPERY.

Like so many other hotels, restaurants and clubs, the Edgewater Beach has chosen for its table-settings —

*TABLECRAFT

(ROSEMARY-BASCO)

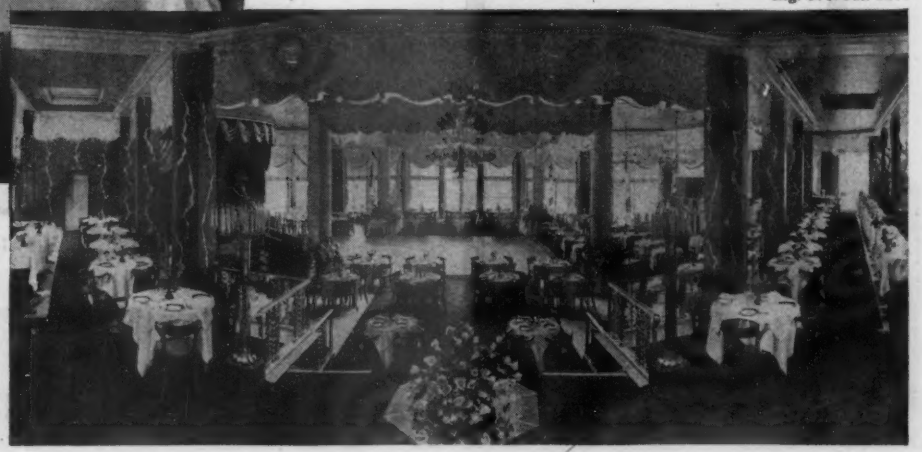
Cloths, Napkins and Damasks, made *right* in America

ROSEMARY SALES

A DIVISION OF SIMMONS CO.

40 Worth Street, New York 13, N. Y.

*Reg. U. S. Pat. Off.



Next to Good Food, People Prefer CLOTH-COVERED TABLES

Tomorrow's POWER Today!

IT'S THE
OPPOSED-PISTON
DIESEL LOCOMOTIVE BY

FAIRBANKS-MORSE

A name worth remembering

You'll find it much cheaper

to give your men these

Instead of these

Protect your production... with AO Safety Goggles

American Optical
COMPANY
SOUTHBRIDGE, MASSACHUSETTS

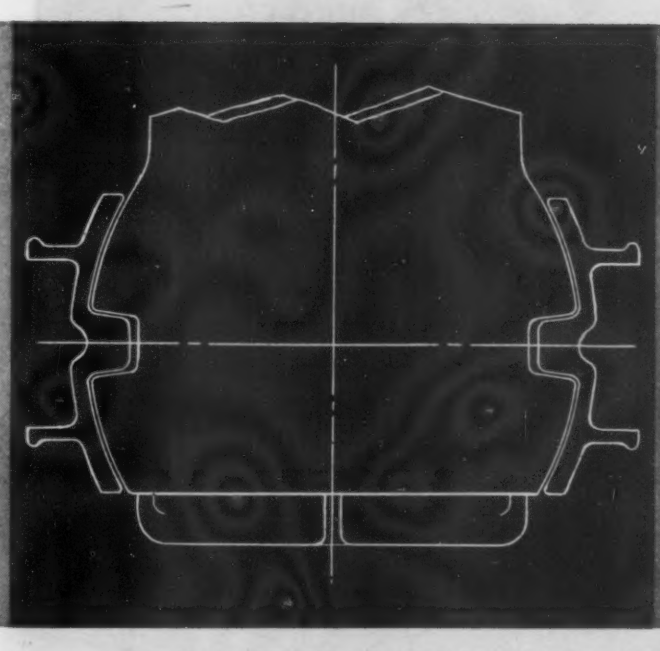
The A·S·F

NO SPRING PLATES!

NO SPRING PLANKS!

BASIC

FREIGHT-CAR TRUCK



There's a difference in the A. S. F. Basic Freight-Car Truck's design—a difference that is basically sound, that ups performance.

Its flanged-type spring-seat design eliminates spring plates and positively prevents loss of springs. The novel column construction embodying a top bolster opening feature facilitates truck assembly and disassembly without removing springs.

Low initial and maintenance costs are characteristic of this truck which is suitable for all-coil or coil-snubber groupings. The truck meets all A.A.R. requirements.

AMERICAN STEEL FOUNDRIES

CHICAGO

MINT-MARK OF FINE CAST STEEL

Coming Events Cast

WHATEVER a.c.f. BUILDS—IT IS KNOWN TO BUILD WELL!

Their Shadows Before

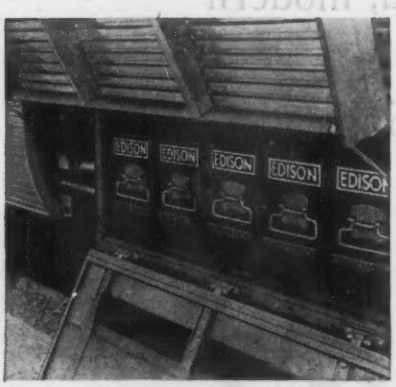
A stone's throw from these steel hospital cars now being delivered from our St. Charles plant stand "mock ups" of passenger cars of tomorrow that a.c.f. will build. ¶ Railroad men, visiting in the St. Louis-St. Charles area, are cordially invited to visit this plant, inspect the "mock ups" and look over our extended, modern facilities for passenger-car building.

a.c.f.

AMERICAN CAR AND FOUNDRY COMPANY

NEW YORK • CHICAGO • ST. LOUIS • CLEVELAND • WASHINGTON
PHILADELPHIA • PITTSBURGH • ST. PAUL • SAN FRANCISCO

Worth Looking Into... for Post-War Cars



Alkaline Batteries are equally suitable for use in 32-volt, 64-volt and 110-volt systems. They have been giving dependable service for many years in all three.

In electrical systems on post-war cars, power demands for air-conditioning, ample lighting, and other passenger conveniences and luxuries will put a high premium on the dependability of the power supply including the storage batteries. On tomorrow's new cars Edison Alkaline Batteries not only can help reduce weight but can also provide unequaled dependability.

In fact, after delivering normal service life on passenger cars, they are often regrouped and reapplied to baggage, express or other cars having smaller load demands. There they give additional years of unfailing service. A number of railroads are getting this "second life" from their Edison Alkaline Batteries. Yet they could hardly afford to do this if they had not learned from experience that an alkaline battery remains a dependable power unit even beyond its normal service life. It's a feature of alkaline batteries that designers of post-war cars are urged to look into. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

Edison

THE LIGHTWEIGHT BATTERY
FOR LIGHTWEIGHT CARS

DOWN WITH UPKEEP COSTS ON SEATS!

Have them upholstered in VELON*

HERE'S an amazing new type of seating material that can cut your recovering and upkeep costs to the bone, and save you many thousands of dollars!

It's Firestone's new wonder fabric called *Velon*.

Velon has been taking the hardest kind of abuse in thousands of public vehicles for more than three years. And yet it still does not show the slightest sign of wear.

You can forget cleaning and maintenance costs with *Velon*. It is grease-proof, vermin-proof and non-inflammable. It comes up fresh and clean as new at the mere touch of a damp cloth or cleaning fluid.

And because *Velon* is so unsoilable, it now makes practical for the first time more beautiful, lighter, brighter colors to decorate your interiors —to give them the kind of eye appeal that will win passenger traffic in the competition ahead.

You can't afford to leave *Velon* out of your postwar plans. Though most *Velon* Firestone makes still goes to the armed forces, Firestone engineers are ready now to advise you on any after-Victory application you may contemplate.

P.S. For completely modern seating use *Foamex* cushioning, Firestone's rubber latex foam.

LISTEN TO THE VOICE OF FIRESTONE MONDAY EVENINGS OVER NBC

ANOTHER CONTRIBUTION TO A BETTER WAY OF LIFE *by* **Firestone**

*Trademark—Pronounced VEL-LON

They didn't have it then

POSTWAR PASSENGERS WILL PATRONIZE CARRIERS THAT OFFER THE MAXIMUM COMFORT, SERVICE, SPEED AND SAFETY.

Modernize with **Westinghouse**

FEELIN

The
ventila
railroa
mecha
dirt, s
per ce
particl
mecha
Prec
only re
passen
cles a
even t
Wit
smoke
refresh
tinuall
proble
exhaus
air. Be
the am
is grea
Writ
senger
senger
Manuf
Pittsbu

CONSU
passenge
driven
generato
fluoresce
tron for
Nofuze
efficient
*Trade-mar

RAILRO

then

RAILWAY ACE

...but they expect it now!

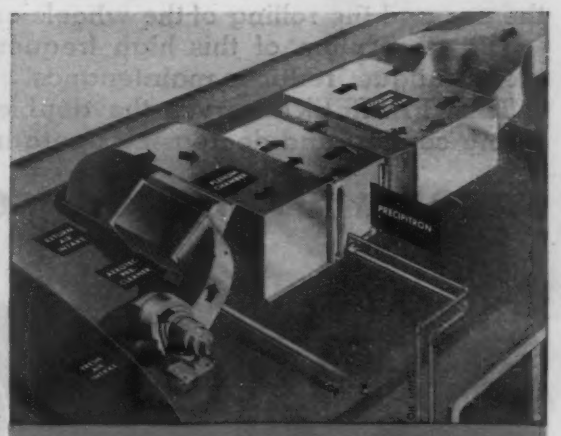
*Precipitron** TO ELIMINATE THAT "SOILED FEELING"... PERMIT SMOKING IN EVERY CAR

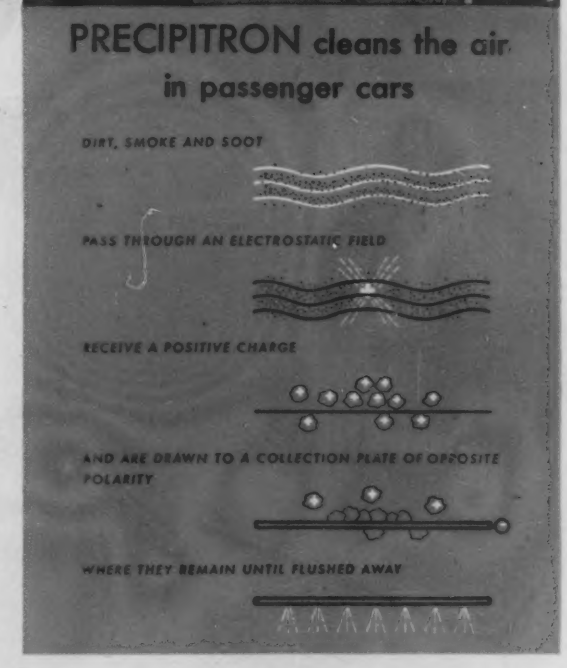
The problem of properly cleaning the ventilating air in passenger cars has plagued railroad men for years. Commonly used mechanical filters can remove only the larger dirt, soot, and smoke particles. Yet 80 to 90 per cent of the total number of air-borne particles are so small that they "leak" through mechanical filters.

Precipitron, the electronic air cleaner, is the only really effective method to clean the air in passenger cars. Precipitron collects dirt particles as small as 1/250,000 of an inch . . . even traps tobacco smoke.

With Precipitron, every car becomes a smoker . . . every car is filled with clean and refreshing air. And with the car cleared continually of smoke and other dust, the heating problem is simplified. It is not necessary to exhaust from the car such a large portion of air. Because more of the air is recirculated, the amount of cold make-up air to be heated is greatly reduced.

Write Precipitron into your postwar passenger car specifications. It is sure-fire passenger comfort. Westinghouse Electric & Manufacturing Company, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-15096



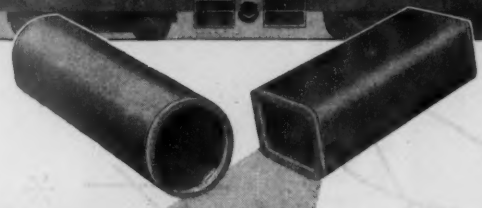

PRECIPITRON cleans the air in passenger cars
DIRT, SMOKE AND SOOT
PASS THROUGH AN ELECTROSTATIC FIELD
RECEIVE A POSITIVE CHARGE
AND ARE DRAWN TO A COLLECTION PLATE OF OPPOSITE POLARITY
WHERE THEY REMAIN UNTIL FLUSHED AWAY

CONSULT WESTINGHOUSE on your plans for passenger car modernization. Available are axle-driven generators for high-speed operation; axle-generator control; compressor motor and control; fluorescent lighting equipment and fixtures; Precipitron for electrostatic air cleaning; water coolers; Nofuze circuit breakers; and other equipment for efficient operation of cars.

*Trade-mark registered in U. S. A.

RAILROAD ELECTRICAL EQUIPMENT

FABREEKA



For Passenger Comfort and Maintenance Reduction on New or Reconditioned Rolling Stock

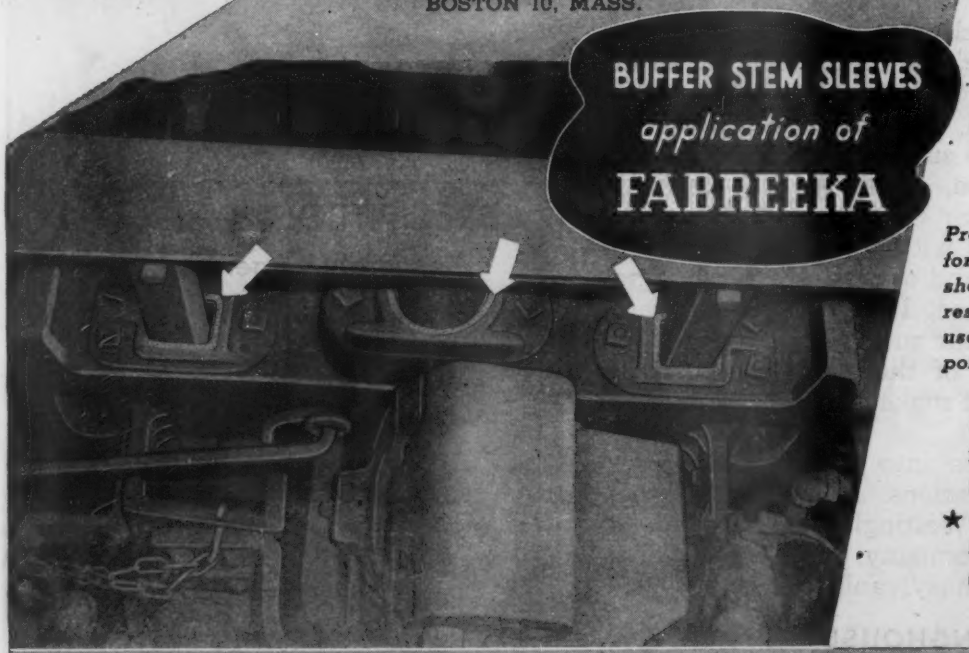
FABREEKA in the trucks of passenger cars absorbs the high frequency vibration and noise which would otherwise be transmitted through the metal parts of the truck assembly to the car body. High frequency vibration and noise result from the impact shocks encountered in the operation of the car and the rolling of the wheels on the rail.

The absorption of this high frequency vibration, a primary cause of metal fatigue, reduces maintenance.

Thus FABREEKA serves the double purpose of increasing passenger riding comfort and decreasing operating costs.

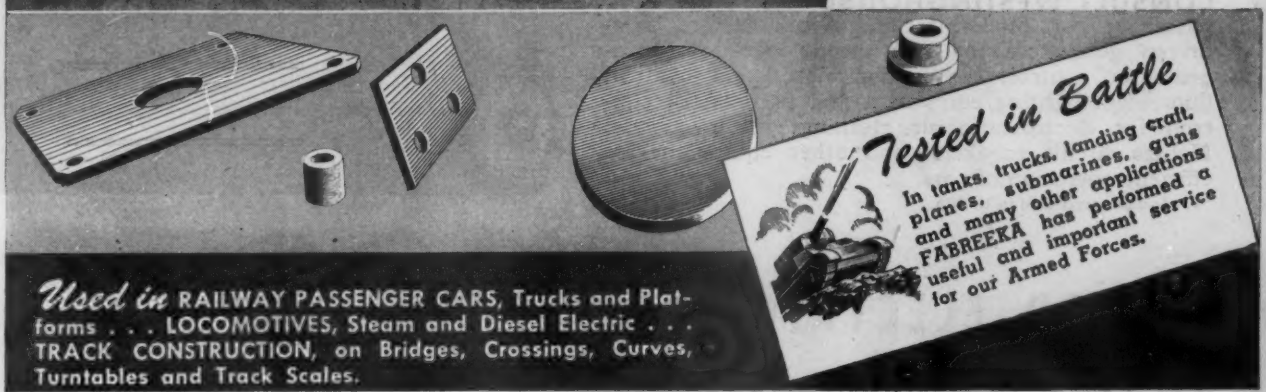
FABREEKA PRODUCTS COMPANY, INCORPORATED

BOSTON 10, MASS.



Proven in the railway field for over 10 years, experience shows that for satisfactory results FABREEKA should be used at these six important points:

1. Coil Springs
2. Center Plates
3. Journal Boxes
★ 4. Buffer Stems
5. Side Bearings
6. Swing Hanger Bearings (under spring plank)



Tested in Battle

In tanks, trucks, landing craft, planes, submarines, guns and many other applications FABREEKA has performed a useful and important service for our Armed Forces.

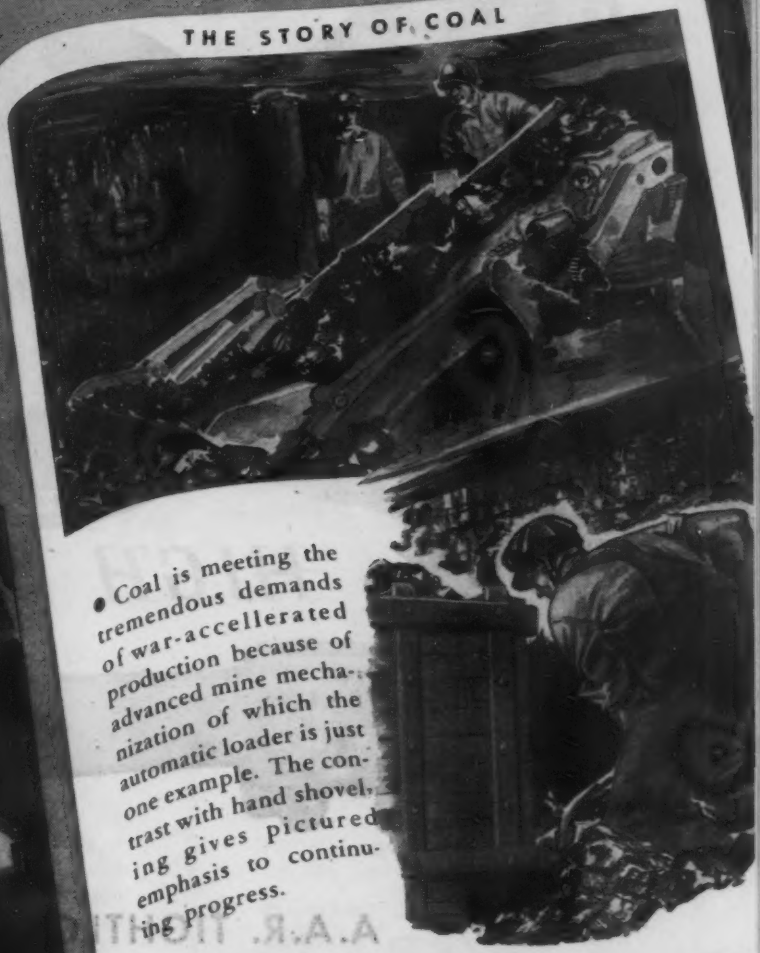
Used in RAILWAY PASSENGER CARS, Trucks and Platforms . . . LOCOMOTIVES, Steam and Diesel Electric . . . TRACK CONSTRUCTION, on Bridges, Crossings, Curves, Turntables and Track Scales.

INTERDEPENDENT DEVELOPMENT
—a Continuing Story

THE HISTORY OF RAILROADING

• Railroads, by improved methods and technical advancements, are expanding their capacity to serve, while saving manpower—as evidenced by the automatic stoker of the big steam locomotive, in contrast to hand firing.

THE STORY OF COAL



• Coal is meeting the tremendous demands of war-accellerated production because of advanced mine mechanization of which the automatic loader is just one example. The contrast with hand shoveling gives pictured emphasis to continuing progress.

MECHANICAL ADVANCEMENTS MULTIPLYING MAN POWER...

COAL and the railroads are going farther, faster these days. The application of mechanical advancements in getting the source of power out of the earth, and applying it to better advantage in solving the problems of national transportation is convincing evidence of progessive, forward-looking management on the part of both coal and rails.

THE M·A HANNA CO

The M. A. Hanna Company

★ 1300 LEADER BUILDING • CLEVELAND 14, OHIO ★

SAFETY & COMFORT

at

HIGH SPEED

A.A.R. TIGHTLOCK COUPLERS

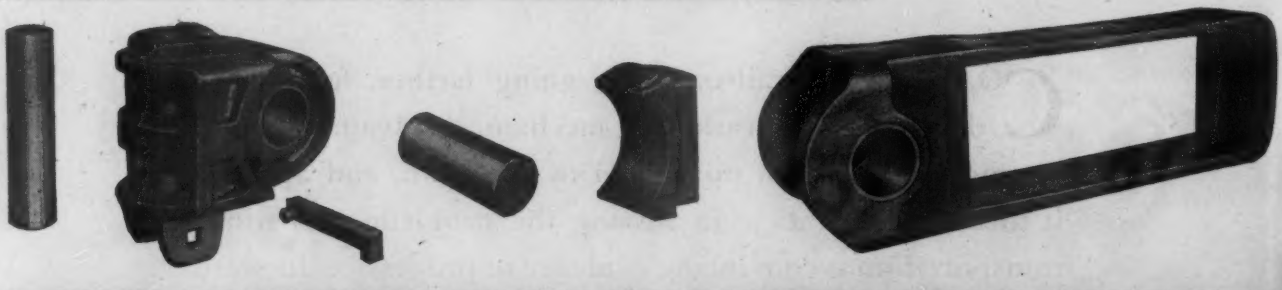
Eliminate slack in coupler contour. **Eliminate noise caused by coupler slack.**

Interlocking feature prevents telescoping and turning over of cars.

Improved anti-creep arrangement, and A. A. R. No. 6 operating mechanism prevents train separation.

Will couple with present standard and M. C. B. type couplers, and when so coupled provides substantial reduction in contour slack.

Wear of coupler head and parts is materially reduced, thus increasing the service life.



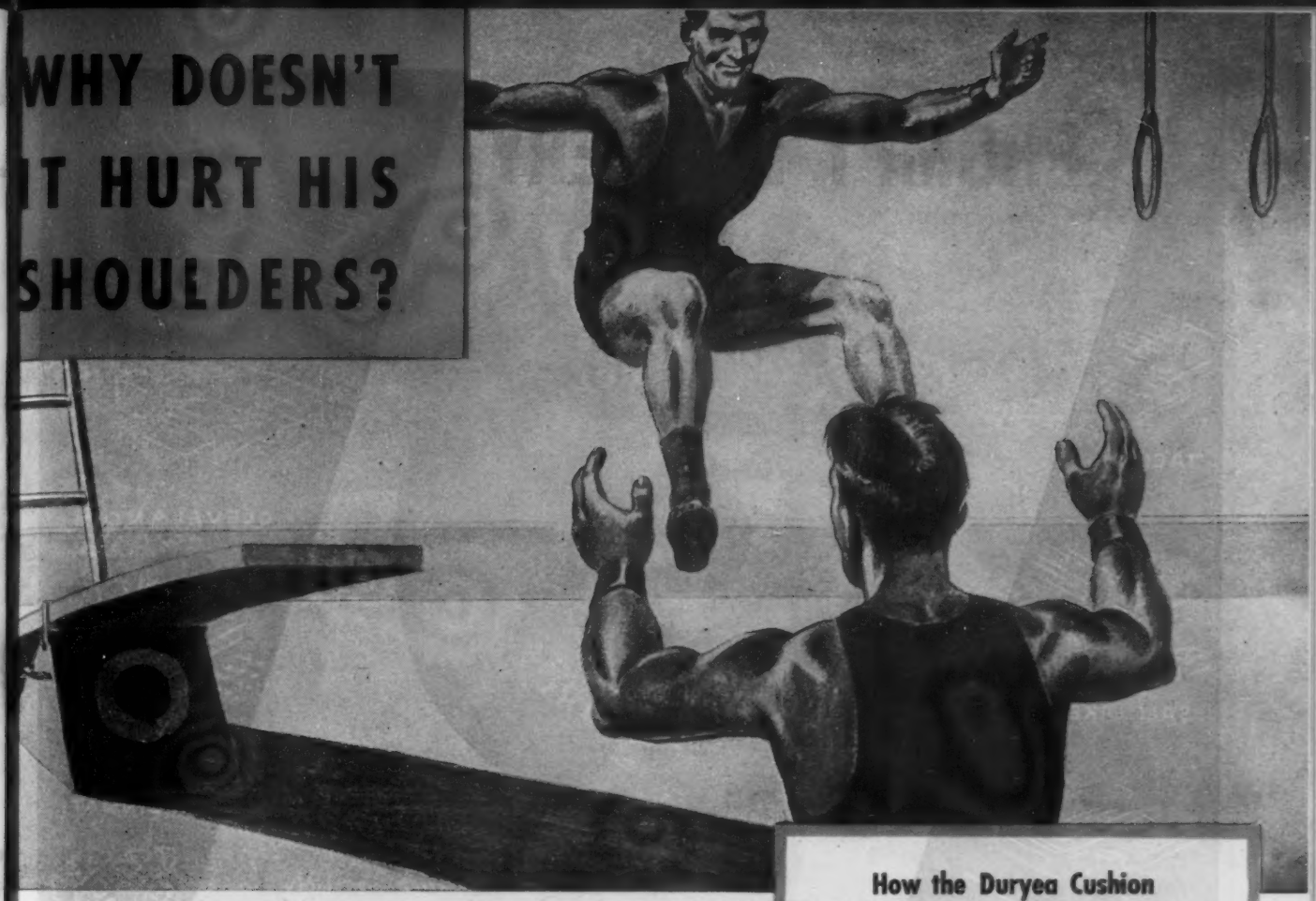
NATIONAL MALLEABLE AND STEEL CASTINGS CO.

General Offices: CLEVELAND, OHIO

Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco.

Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

WHY DOESN'T IT HURT HIS SHOULDERS?



A 200-pound acrobat leaps from a springboard, lands *hard* on his partner's shoulders—a blow that might easily break both of a man's collarbones. But the athlete is trained to use flexed back, hip, knee, and ankle muscles to *travel* the force of such an impact through his whole body to the floor—so that most of the shock is absorbed.

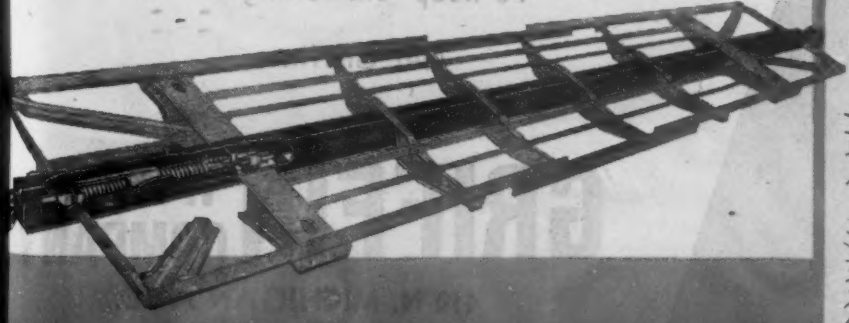
MOVEMENT CUSHIONS THE SHOCK!

The same principle, in the Duryea Cushion Underframe, gives you SHOCKPROOF SHIPPING.

The unique Duryea floating center sill *travels* the force of any impact the entire length of the car, absorbing it as it goes in big cushion springs. Car and lading ride *over* the blow, comparatively undisturbed.

O. C. DURYEA CORPORATION

30 Rockefeller Plaza, New York 20, N.Y. - 135 So. LaSalle St., Chicago 3, Ill.
725 Fifteenth Street, N. W., Washington 5, D. C.



DURYEA *Cushion* UNDERFRAME

FOR FREIGHT CARS

e Modern Safeguard For Shockproof Shipping

How the Duryea Cushion Underframe Contributes to Victory

PROTECTS car and lading, prolongs car life, cuts damage claims.

PERMITS higher handling speeds.

ELIMINATES gear replacements maintaining efficiency for life of car.

SAVES TIME loading and unloading. Needs less packing and bracing.

SAVES MONEY usually spent for maintenance on every part of car.

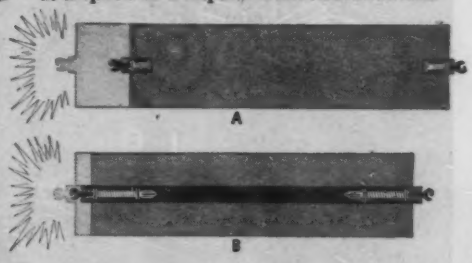
COMPLEMENTS air brake; Duryea cars withstand abrupt stops.

CUTS SLACK to pre-determined ideal.

COSTS NO MORE than conventional type, for average Duryea gear.

Here's what actually happens

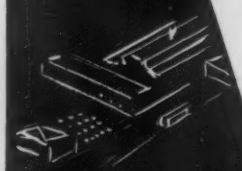
. . . when two stationary freight cars receive the same impact, equivalent to a 50-ton car, loaded to capacity, coupling at a speed of 4 m.p.h.: CONVENTIONAL



CAR (A): Draft gear "goes solid," car receives almost entire impact.
DURYEA CAR (B): Shock absorbed by cushion gears, car and lading are comparatively undisturbed.

PROMPT DELIVERY

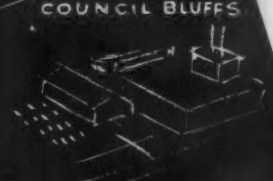
TACOMA


SALT LAKE CITY

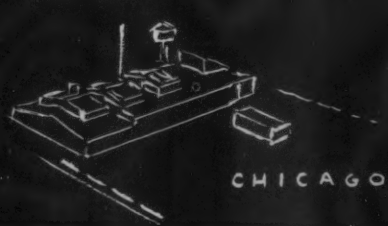
DENVER

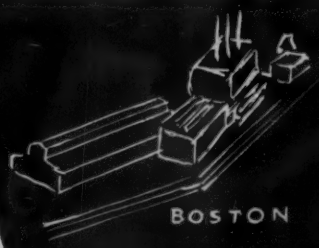
LOS ANGELES

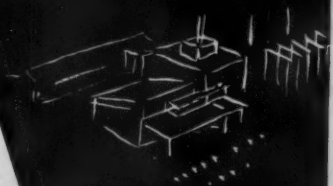
COUNCIL BLUFFS

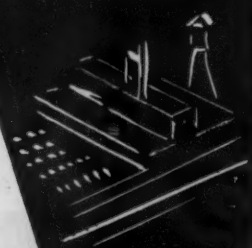

KANSAS CITY

DETROIT


CHICAGO


BOSTON


CLEVELAND


CINCINNATI

ST. PAUL

THERE is no bottleneck encountered when you order Chilled Wheels from Griffin. All of our 12 plants have a large wheel supply on hand, and each plant is so located to assure your railroad the shortest haul on new and scrap wheels.

To keep 'em rolling

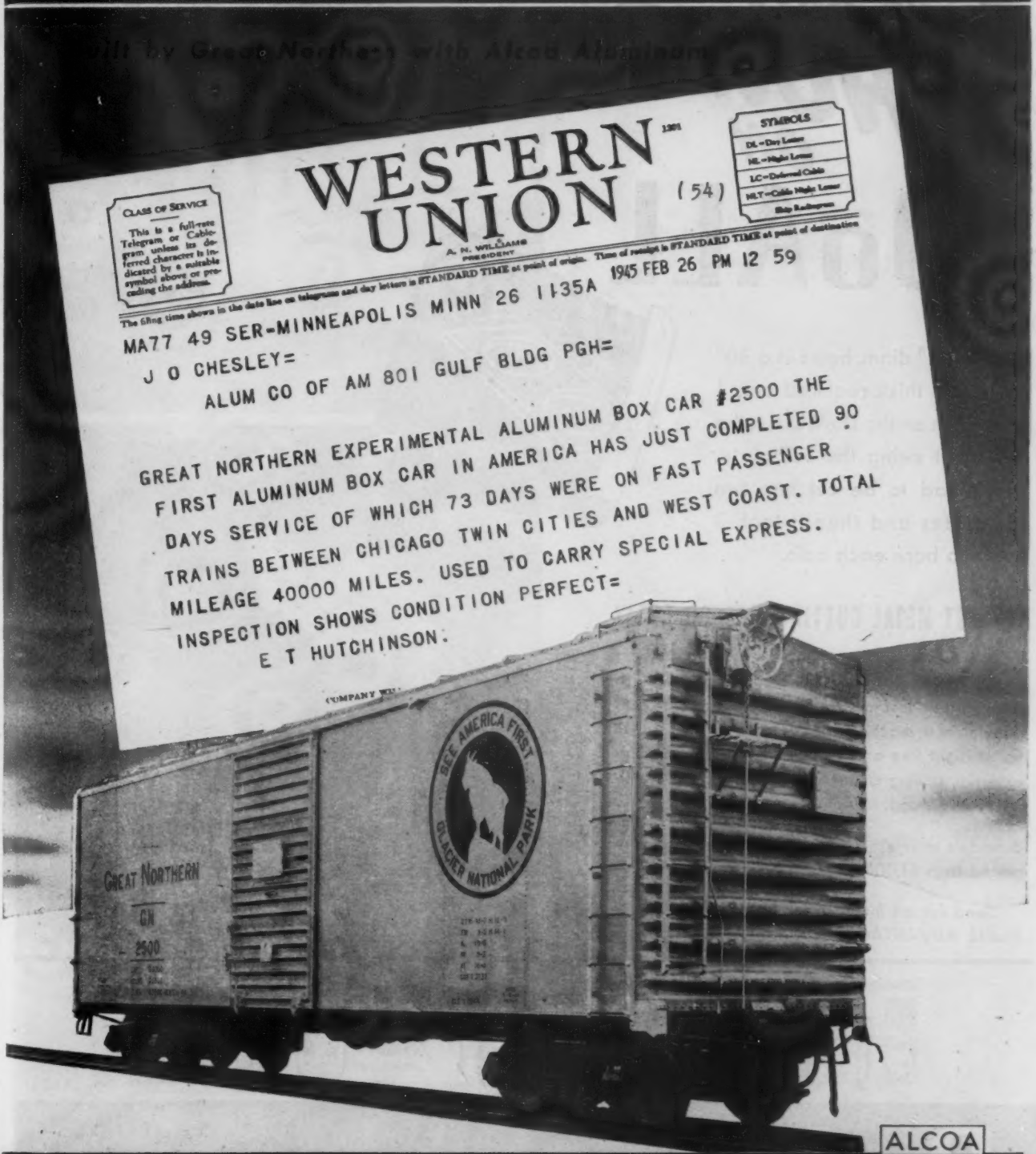
Get Griffin

GRIFFIN WHEEL COMPANY

410 N. MICHIGAN AVE.
CHICAGO, 11, ILLINOIS

LATEST REPORT

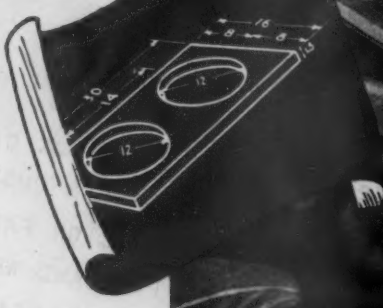
ON AMERICA'S FIRST ALUMINUM BOXCAR


WESTERN UNION
(54)
CLASS OF SERVICE
This is a full-rate Telegram or Cable-gram unless its deferred character is indicated by a suitable symbol above or preceding the address.
SYMBOLS
DL = Day Letter
NL = Night Letter
LC = Deferred Cable
NLT = Cable Night Letter
Ship Radiogram
A. N. WILLIAMS
PRESIDENT
The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination
MA77 49 SER-MINNEAPOLIS MINN 26 1135A 1945 FEB 26 PM 12 59
J O CHESLEY=
ALUM CO OF AM 801 GULF BLDG PGH=
GREAT NORTHERN EXPERIMENTAL ALUMINUM BOX CAR #2500 THE FIRST ALUMINUM BOX CAR IN AMERICA HAS JUST COMPLETED 90 DAYS SERVICE OF WHICH 73 DAYS WERE ON FAST PASSENGER TRAINS BETWEEN CHICAGO TWIN CITIES AND WEST COAST. TOTAL MILEAGE 40000 MILES. USED TO CARRY SPECIAL EXPRESS. INSPECTION SHOWS CONDITION PERFECT=
E T HUTCHINSON.
SEE AMERICA FIRST
GLACIER NATIONAL PARK
GREAT NORTHERN
GN
2500

ALCOA ALUMINUM

ALCOA
ALUMINUM

3 HOUR LATHE JOB DONE IN 1 HOUR ON DoALL



To bore 12" diam. holes in a 30" plate 1½" thick required only 1 hour each on the DoALL. A lathe could not swing the 30" plate, which had to be cut into two 15" plates and then it took 3 hours to bore each hole.

FASTEST METAL CUTTING METHOD TODAY

Whether it's armor plate, blocks a foot thick, tubing or stacked sheets, the DoALL goes right through them with no lost motion, time or energy. No other equipment or machine can compare with the DoALL for straight line and contour work, internal and external sawing of metals, alloys, plastics, laminates and wood.

6 models to select from—a size for every need—priced from $1,000 to $5,000 with motors.

Send for an interesting story-in-pictures of DoALL ADVANTAGES over 9 Basic Cutting Methods

DoALL

CONTINENTAL MACHINES, INC.
1345 S. Washington Ave. • Minneapolis 4, Minn.

NC.
Minn.

Report **No. 8** on the latest advance in railroad communications

V.H.F. RADIO directs switching operations in Burlington's Chicago yards

A four month test of V.H.F. (Very High Frequency) Radio in the Chicago yards of the Chicago, Burlington & Quincy Railroad has demonstrated that substantially improved switching service and all around efficiency can be achieved by its use.

During this period, the yardmasters have been able to establish at any time—from any one of three yard control points—constant two-way communication with the desired radio-equipped engine by merely picking up a hand set and pushing a button. Moreover, continuous vocal contact has been maintained with engines engaged in interchange and industrial switching operations up to 12 miles from the central station—a proof that V.H.F. radio provides satisfactory communications in highly congested areas.

The Burlington plans permanent installations of radio communications equipment in its principal yards as soon as the necessary authority has been issued by the Federal Communications Commission.

If you are interested in further details of this and other practical tests write Bendix Radio—first to develop V.H.F. Radio for the railroads.

BENDIX IS A TRADE-MARK OF BENDIX AVIATION CORPORATION

Bendix RADIO DIVISION

BENDIX AVIATION CORPORATION, BALTIMORE 4, MARYLAND

"MAKING THE GRADE"
WITH A DRAG OF 45 MILLION CARS

American Railroads made it! In 1944, they moved the largest total of ton-miles in history. And this despite the serious shortage of manpower and equipment.

This gigantic job was only made possible by dependable motive power and rolling stock—much of it equipped with sturdy

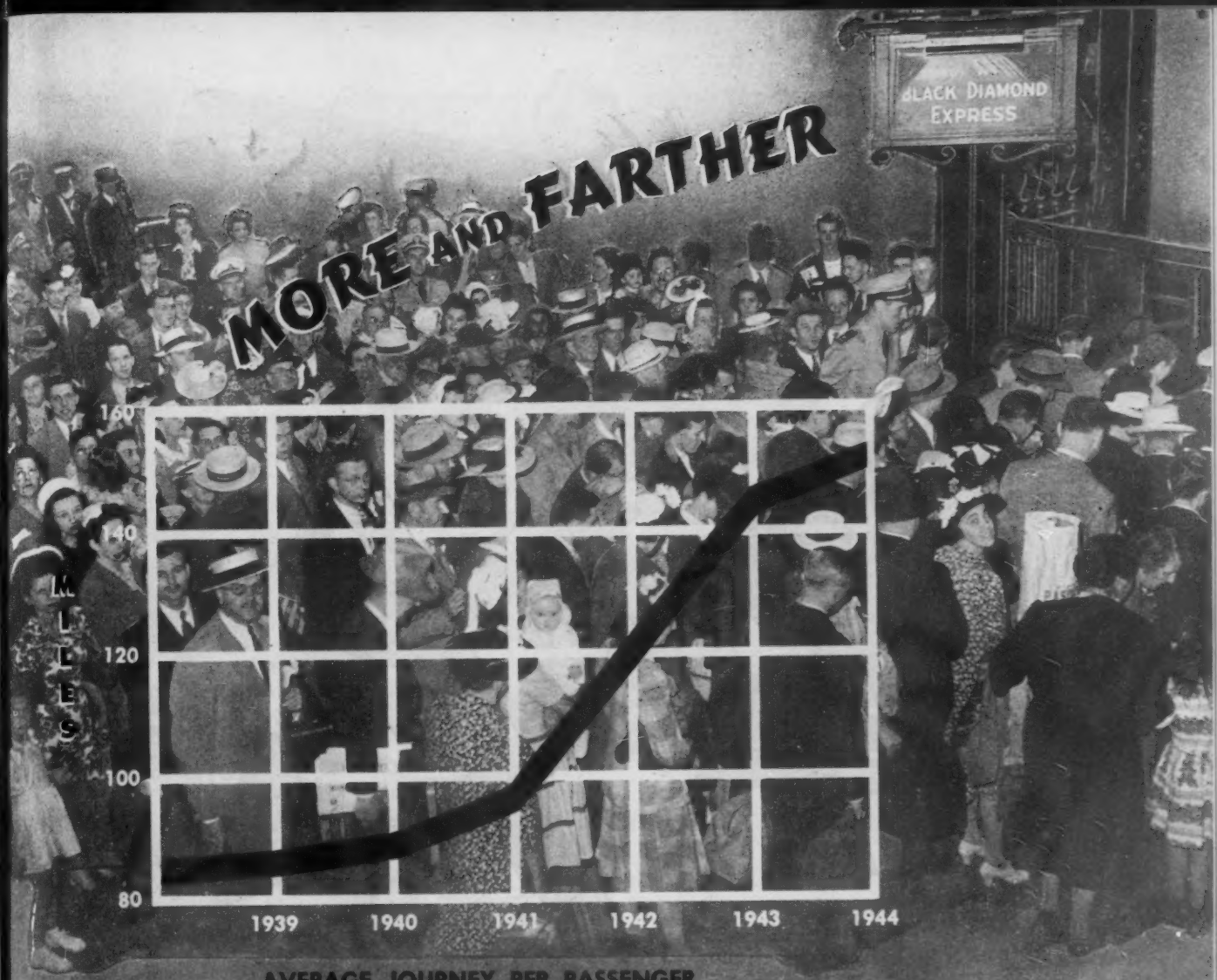
N•B•M
CAR JOURNAL BEARINGS AND ENGINE CASTINGS

NBM

NATIONAL BEARING
DIVISION
ST. LOUIS • NEW YORK

AMERICAN Brake Shoe COMPANY

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.



AVERAGE JOURNEY PER PASSENGER
(non-commutation)

With the average haul still growing longer and passenger traffic still increasing, seat upholstery will get 5 years of prewar wear in this one wartime year!

Realizing your desire to keep passenger equipment as presentable as possible, we still give transportation upholstery a "clear board" over everything in our mills except military textiles.

Yes, we very much "know there's a war on". We will continue to do everything we can to help you hold the wartime gains in passenger revenue until you can get delivery of the new equipment that will make a goodly share of this traffic permanently yours.

Velmo MOHAIR
T. M. Reg. U. S. Pat. Off.
TRANSPORTATION UPHOLSTERY

CHASE

L. C. CHASE AND COMPANY
DIVISION OF GOODALL-SANFORD, INC.
295 FIFTH AVENUE, NEW YORK 16

IT CAN TAKE IT

When the Army's 155-mm. gun—"Long Tom"—lets go, it has a kick like forty mules. That's reason enough for building the carriage with N-A-X HIGH-TENSILE STEEL. The inherently finer grain structure of this low-alloy steel provides exceptional resistance to impact and fatigue, just as it insures unusual ductility for a metal of such high tensile strength. In bitter cold and tropic heat, N-A-X HIGH-TENSILE STEEL is "taking it" in this exacting application and in other military applications of all types.

IT CAN DISH IT OUT

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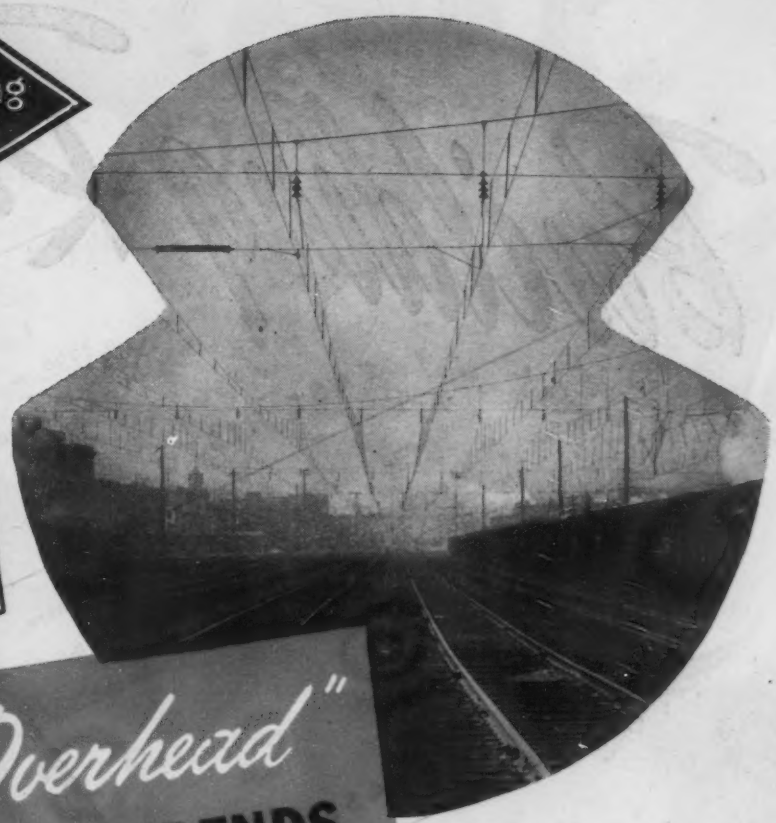

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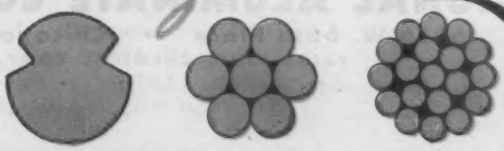

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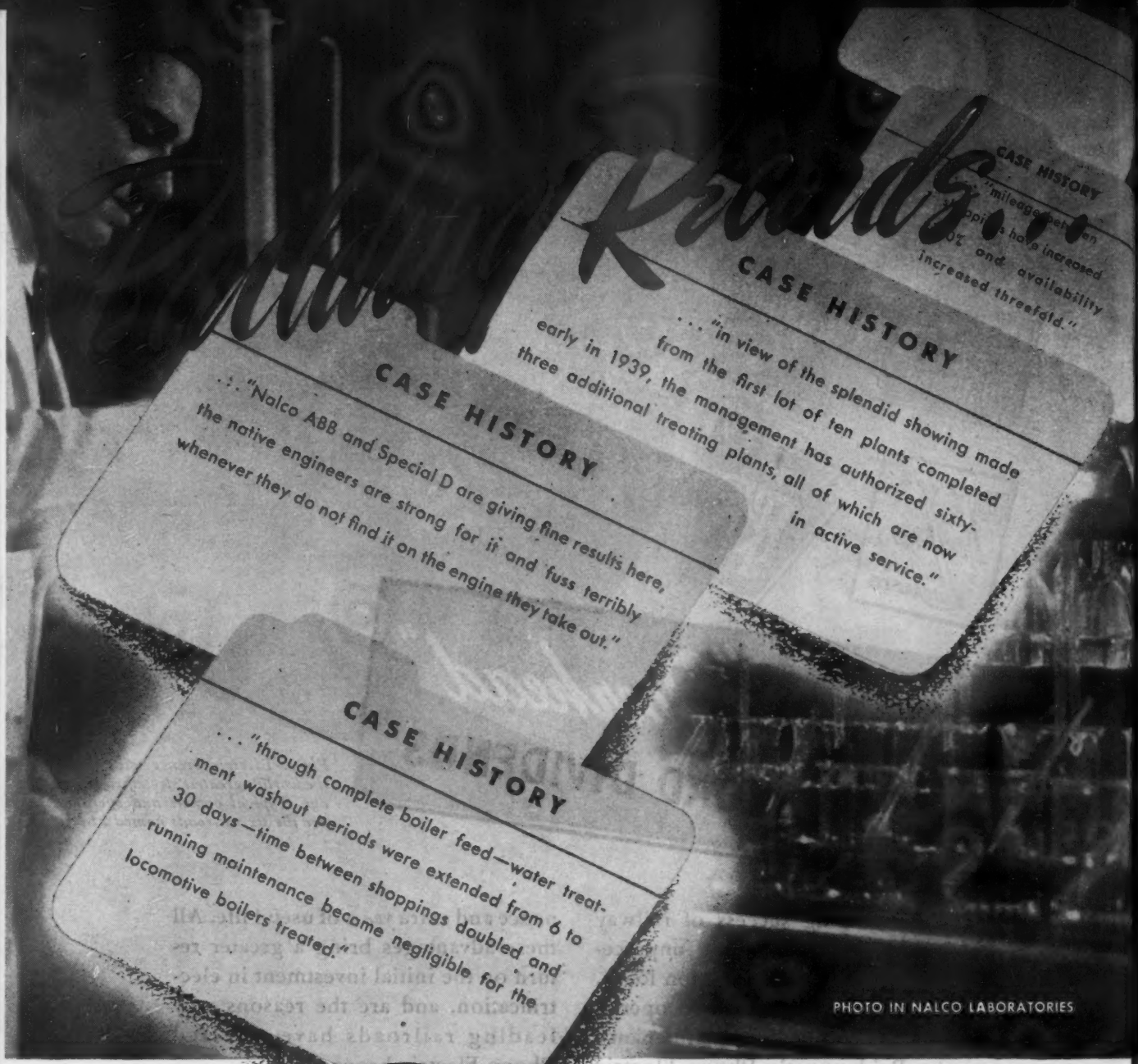
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MEMBER 1945

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Railway Age

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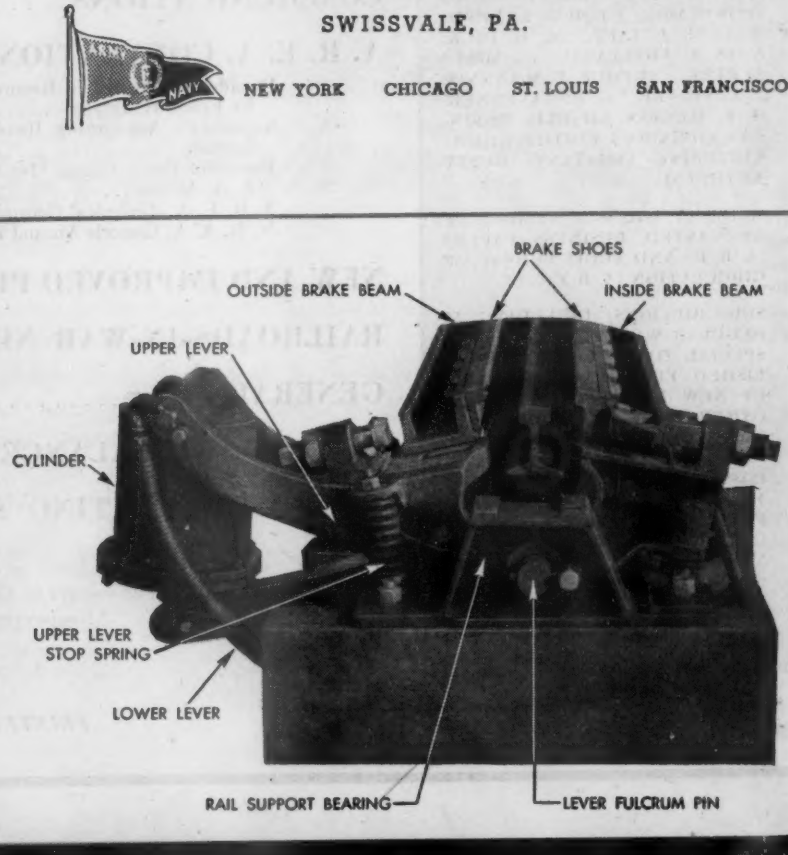

The Week at a Glance

CONVENTION-IN-PRINT: The bulk of the feature space in this issue is devoted to reports from the officers and the standing and special committees of the American Railway Engineering Association, thus making available technical information pertaining to the location, construction, operation and maintenance of the fixed properties of railroads which would have been presented in the annual convention of this organization if wartime conditions had not made such a meeting inadvisable. At the same time, through the advertising pages and the descriptions of new and improved products of manufacturers, an exhibit-in-print is presented in lieu of the related exhibition of the National Railway Appliances Association. Frank R. Layng, the retiring A. R. E. A. president, points out that the most important service which his organization has rendered the railroads and the armed forces in this time of war is the long-term development of standard specifications and practices that are authoritative and encyclopedic in scope in relation to railway fixed properties.

●

HOST'S DUTY: An editorial this week calls attention to the desirability of affording foreign railroad men who come to this country to observe and to learn the widest possible opportunity to become acquainted with our institutions and customs and ideals as well as with our technological achievements and operating routines. If these visitors return to their own countries no better informed about these aspects of American life than when they came, we have failed in our full duty to them as hosts and to ourselves as beneficiaries of any condition that promotes better international relationships.

●

PENSION REBUTTAL: Reiterating their basic argument that the best possible form of social security is a steady job at fair wages, the railroads this week continued to challenge before a House committee the actuarial soundness of the bigger benefits bill which the Railway Labor Executives Association is endeavoring to get through Congress. In addition to calling attention to a few of the "jokers" in the program—such as are attached to the maternity benefits, for example—Dr. Parmelee exposed some of the mathematical legerdemain performed from time to time by Retirement Board Chairman Latimer, while the Reading's President Brown quoted that same proponent of higher taxes on employers and greater generosity to employees in support of the very principle—that is, preservation of accumulated benefit reserves from the erosion of diversions alien to their original purpose—which this proposed legislation would undermine. Details appear in the news section.

●

CAR SUPPLY: Almost in juxtaposition in this issue's news pages are (1) an account of the difficulties American railroads are experiencing in keeping pace with the demand for equipment, particularly for high-class box cars, in the face of W. P. B.-slashed steel allotments, and (2) a report of the quantities of railway material which lend-lease has shipped to the Soviet Union in the past 15 months. As Colonel Henry told his St. Louis audience, the spring movement of grain and coal will be unusually heavy, while normal car distribution has been upset by the severe storms in the Northeast. Meanwhile the number of available sound, clean cars dwindles steadily, and the output of new cars this year, of all types, isn't expected to exceed 45,000. In Washington the belief prevails, apparently, that there are a great many needs that come ahead of freight cars, but the farmers whose grain still lies piled in Midwest fields, among others, might be disposed to dispute that verdict.

●

TIME AND MONEY SAVER: A description of the centralized traffic control installation which is enabling the Kansas City Southern to save 40 min. for each freight train on a 46-mile run appears on page 483. The single-track line involved, from DeQuincy, La., to Beaumont, Tex., is used also by the Missouri Pacific (Gulf Coast Lines) and on normal days 40 to 45 trains are operated over it. Prior to the installation of this equipment timetable and train order operation prevailed in this territory, which was not provided with automatic signaling.

●

JURISDICTION QUESTION: Apparently faced with the question for the first time, and finding it a little difficult to come to an agreement on it (tie-breaker Johnson had to be called in), the I. C. C., as reported in the news pages, has concluded that it can properly take official notice of its own prior decisions in major proceedings when acting in related minor proceedings. In the same case it went on to assert its continued jurisdiction, even though a court had issued a permanent injunction against the execution of a commission order based on a division report.

●

NEWS NOTES: Brig. Gen. William J. Williamson has been chosen as first president of the new Army Transportation Association, which already has more than 9,000 members. . . . The Port of New York Authority is proposing to put up a $13 million union bus depot, at its own expense, relieving these competitors of the railroads of the responsibility of providing such facilities themselves. . . . The "correction" after 2½ years of the certificate of authority which the I. C. C. issued to Seatrain stirred some of the commissioners to express vigorous objections to this procedure. . . . Diesel installations in freight service last year accounted for almost two-thirds of the total increase during the year. . . . Congressman Bulwinkle has put in a new and broader bill to bring the cooperative activities of the carriers under the aegis of the I. C. C. . . . Montreal's new mayor objects to the completion of the Canadian National's belt line project in that city. . . . The Atlantic Coast Line has sold part of its Louisville & Nashville stock. . . . Cars handled through the ports hit an all-time high in February.

THE LONG VIEW: Even if those who are subject to the regulation of administrative agencies of the government cannot forestall the appointment to such bodies, at times, of men who are not qualified by experience and character and fundamental philosophies to meet the exacting demands of these difficult and responsible positions, they can at least—as this week's leading editorial points out—recognize and properly honor those public servants who show by their actions that they are guided by high principles and honest intentions in the exercise of their duties, however much they may err at times because they are misinformed or overburdened. While a temporary selfish advantage may sometimes be derived from favors shown by an administrator whose motives and processes are less commendable, in the end the legitimate interests of the industry which is subject to regulation are better served, it is argued, by the officer of unassailable integrity and open mind.

●

PRINCIPLES APPLIED: Putting this principle into practice, those who appeared before the bench behind which Joseph B. Eastman sat in Washington for a quarter of a century this week had an opportunity to pay their tribute to him as an outstanding administrative officer, and the occasion (the dedication of a bust in the I. C. C. building) was one to direct renewed attention to the "primer" for the guidance of administrative agencies which Mr. Eastman formulated out of his long experience and set forth on his last public appearance, a little more than a year ago.

●

OPPORTUNITIES: Applications to railroad requirements of low-alloy high-strength steels are discussed in a feature article this week, in which F. D. Foote of Alloys Development Company suggests that such excellent results could be secured through the use of these materials in new structures, both fixed and mobile, that most of those now existing would have to be slated for early retirement. This can be accomplished, he suggests, by tailoring the properties of the new materials to suit the individual circumstances in which they must function, and he believes the chemists and metallurgists who concoct them and the engineers and technicians who employ them have the skills and experience to do the tailoring successfully. There remains the necessity of demonstrating the economies to be secured through these applications, and this merchandising job, he says, is one in which all of those interested in furthering the use of these steels must participate.

●

RESEARCH EXPANDED: In spite of the difficulties under which association activities must be performed in wartime, the A. R. E. A., as editorial comment discloses, has been able to broaden the scope of its research activities in the past two years, so that engineering and maintenance men are in a position both to utilize the product of this research in their wartime tasks and to prepare themselves for the new responsibilities and opportunities that will fall to them later.

IT'S A GREAT NEW DAY FOR RAILROADING

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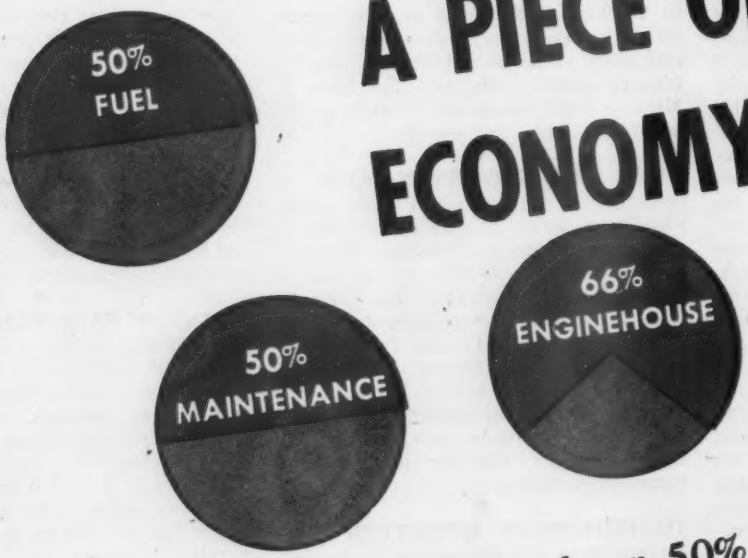

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RAILWAY AGE

Eastman's Legacy

Most readers of these pages will recall the remarkable list of twelve principles for the successful functioning of governmental regulatory and administrative bodies in which, just before his untimely death, Joseph B. Eastman summarized the lessons of his rich experience, and which was published in *Railway Age* of March 25, 1944, page 602, and was widely reprinted throughout the country.

Now, in the Journal of Land & Public Utility Economics, a writer, E. W. Morehouse, has reviewed this Eastman dodecalogue, setting forth its contrasts with views of two eminent New Dealers—Supreme Court Justice William O. Douglas and Dean James M. Landis—who have written on the same subject.

Independence

Members of these administrative tribunals, said Mr. Eastman, must be free of "the domination or influence of either the President or Congress or of anything else than their own independent judgment of the facts and the law." Dean Landis is quoted, to the contrary, as accepting the "dependence of the administrative upon the other departments of government"; and concluding that, "inasmuch as good will is essential in order to assure uninterrupted means for the effective pursuit of policies, personal antagonisms arising out of a disregard of patronage problems cannot be ignored." He counsels that, "on occasion it may even be necessary to cement alliances by a wise use of the power of appointment."

"The statutes which the tribunal administers should be well, simply and carefully framed," Mr. Eastman said—but, observes the writer in the Journal, "if I read Dean Landis correctly, he would favor, in certain fields at least, a very broad delegation of power to the administrative agency, giving it considerable latitude in applying this power." If two constructions of a statute were possible, one giving an administrative body broader power than the other, it is believed that both Justice Douglas and Dean Landis would favor the latter course.

Courts Need to Be Watchful

The commentator observes that, however greatly cumbersome legislative processes may be deplored, they are the only safeguard against the degeneration of administrative discretion into "administrative license." Mr. Eastman warned that "the courts were at one time much too prone to substitute their own judgment on the facts for the judgment of administrative tribunals; they are now in danger of going too far in the other direction." It is not the belief of Mr. Morehouse that either Dean Landis or Justice Douglas would go as far as Mr. Eastman did in calling for court condemnation of administrative decisions "not supported by substantial evidence."

Most of Mr. Eastman's twelve principles, however, cannot be set up for comparison with the opinions of the self-confident young men in government who are hastening the country along, cross-lots, toward Utopia—for the good reason that they are too bright to give their views on such matters a framework of words. Their opinions on these questions must be judged by their actions which, few will deny, speak eloquently enough.

What, for instance, is the opinion of New Deal philosophers on Mr. Eastman's dictum that: "Zealots, evangelists and crusaders have their value before an administrative tribunal, but not on it"? Or of the Eastman declaration that moral courage is a prime qualification which, however, a member of an administrative body can display nowadays only in dealings with farm or labor organizations, it being no longer dangerous to incur the displeasure of a banker?

Qualifications of Regulators

The quality of character and intelligence of our public servants is a matter of primary importance to such industries as the railroads which can do nothing, practically, without some government participation. If moral and intellectual misfits are appointed to responsible posts, the layman cannot prevent it, but he can, at least, exercise some influence by according recognition and honor to those public officials who make a conscientious effort to be reasonable and just. Even mediocre men usually have potential qualities of higher order which may be brought forward by an environment aimed at calling out the best in them.

Too often, though, the immediate temptation may be to lionize the functionary who is "on our side"—temporarily—for some selfish reason and to oppose a man who with mistaken uprightness is, temporarily, with the opposition. When Joseph B. Eastman was named Federal Co-ordinator (in those days, be it remembered, he was a leading protagonist of government ownership—but off, not on, the bench) a far-sighted chief railway executive observed: "He is honest and intelligent. I am for him." In the long run, it is the administrator of insight and character who will best protect the legitimate interests of regulated industry, so long as its purposes are honest and for the public advantage.

A Bumper Crop

The plains of Texas, Oklahoma and Kansas are verdant with what is close to an unprecedented stand of wheat and all indications point to a total yield as large, if not larger, than the record crop of 1931. In the last week rain falling at just the right moment to do the crop the most good has virtually assured a record harvest of winter wheat.

Since the combine method of harvesting the wheat became general, the transportation problem has been complicated. Under the old threshing method, the movement of wheat extended over some months, as against two or three weeks under the new method. Obviously, the dumping of such a volume of traffic upon the railways in such a short space of time presented difficulties, which, however, until the war, were solved by cooperation between the Car Service division, A. A. R., the eastern and southeastern lines and the western railways. Prior to each harvest season a steady flow of box cars, suitable for wheat loading, moved into the loading territory. In this manner, thousands of cars were stored on sidings in the wheat-growing areas. There was little or no delay in getting cars to individual shippers and to elevators under this system.

Two factors now operate against the former smooth working of this system for handling the grain. In the first place, box cars in the good condition necessary for wheat loading are in such constant demand in industrial districts that only a comparative dribble moves West prior to the loading season. Secondly, under the change in the grain marketing plans since the war, the storage space in elevators is usually much more occupied than was the case heretofore. This year, unless some heavy movements not at present contemplated take place between now and harvest time, there will be less elevator space available than in any year of the last decade, except perhaps 1943. Thus it will undoubtedly be necessary to continue the permit system under which proof of the availability of storage space is necessary before a shipment can be loaded. This, of course, is designed to prevent the use of cars as storage bins and, in previous years, it has accomplished this object.

No system is effective, though, if the necessary cars are not available. The difficulties attendant upon getting cars from east to west are indicated by the results of the directive issued by the O. D. T. in mid-February, requiring the eastern roads to deliver some 1,500 empties daily to western roads at Chicago, St. Louis, Memphis and Peoria. What actually happened was that for some weeks only about 60 per cent of this quota was filled and even at present it is running only about 80 per cent. Of course, severe winter weather and later widespread flood conditions operated against the fulfillment of the requirements of the O. D. T. If, for any reason, orders for delivery of empties to western connections in the month immediately prior to the grain movement are not followed out better than it was possible to meet this directive, a serious situation will be encountered on the wheat loading railways. Of course, wheat can be piled on the ground if there are no cars available but this results in a food wastage of a staple agricultural product that may prove quite serious in wartime. The only answer to prevent a serious and unfortunate transportation situation from developing is for the eastern and southeastern roads to return western-owned box cars suitable for wheat loading just as promptly as possible and in such numbers as may be requested.

Guests from Abroad

It has long been the custom in normal times for railroads in foreign countries to send representatives here to study American railroad practices. Many years ago a young railroad man from abroad, in the course of such a visit, made many warm friends and returned to his homeland greatly impressed with what he had seen of American social and home life. Many years later, when he came into a position of authority, he was greatly perplexed because the young men on his staff, returning from tours of duty in this country, spoke critically and pessimistically about Americans, our way of living and our interests. With great care he selected and assigned a promising young officer in the traffic department to visit the United States.

The young man came ostensibly to study our traffic practices, but his real mission was to discover why his fellows had obtained what seemed to the higher officer to be gravely erroneous impressions about this country. The answer was not hard to find. The visitors went at their tasks of studying our practices in a businesslike manner. Unfortunately however, Americans, engrossed in their own affairs, did not attempt to cultivate them socially. The young men lived entirely too much by themselves and seldom, if ever, had an opportunity of going into American homes and participating in our social life. After discovering these facts the traffic officer deliberately set out to make friends among Americans. Probably no young foreigner who has come to our shores on a business mission has ever been received in so many homes within a period of a year or two as was this young man. His report must have been a constructive one, for staff representatives of his railroad who later came to this country seemed to have capitalized upon his findings.

It is difficult for the foreigner to know how to make those contacts that will really get him into American homes and into our confidence, and it is not surprising that representatives coming from all over the world have returned to their homelands with misleading impressions.

Today, in war times, there are in this country great numbers of what might be called technical trainees, who come largely from Latin America and China for training in our industries, businesses and professions. As one business man pointed out, these trainees, coming here for these new experiences and skills, will affect the lives of uncounted multitudes in their own countries.

Colonel J. Monroe Johnson, director of O. D. T., has just announced that the first of a group of 110 Chinese, who are to be trained on American railroads, have arrived in this country. These young men are graduate engineers of Chinese colleges and have had a minimum of three years continuous experience on Chinese railroads. They have been carefully selected for their ability, leadership, scholastic attainment and aptitude for railroad work. They are men of culture and are being assigned to different railroads throughout the country. They will be given every facility to secure

practical and technical information about the railroads and their operation.

It will be just too bad, however, if in addition they do not come so closely and intimately in touch with American life that they will understand our country, its ideals, its form of government and the spiritual heritage which has stabilized and safeguarded it. Railroad men are known because of their friendliness, and it will mean much to our friends from abroad and to the cultivation of better international relationships, if we extend the right hand of fellowship to these visitors and do what we can to insure their comfort and convenience and a better understanding of American institutions.

The Price Problem

With the World War at its height, the industrial organizations have gone "all-out" to back up the armed forces with adequate equipment and supplies and to take care of our more immediate civilian necessities.

Plants are in continuous operation. Because of the man-power shortage it has been necessary to extend working hours, with resulting heavy penalty costs for overtime. Increased mechanization has been resorted to wherever possible, but the equipment to serve this purpose is available only in limited amounts. Old plants, which were due for rehabilitation or elimination, have had to be continued in operation. The excessive demands for production have been met, but in many instances it has been done without regard to economy.

The annual reports of the railway supply manufacturers for 1944, now being made public, contain interesting facts and sidelights on the problems of production and price control. The American Brake Shoe Company, in commenting upon the effects of price control, makes this observation as to one of its principal products—the brake shoe. "The ceiling price was based on sales prices of October 1, 1941. Since then per-ton cost of labor has increased 50 per cent, of material 13 per cent, and all other costs 20 per cent. Owing to heavy demand, maximum production has been necessary, involving overtime work. In one month ten brake shoe plants operated at a loss. One of these plants has operated at a loss for nearly three years."

"Why," may be asked, "the increase of 13 per cent in material prices, if ceilings were maintained on the prices of raw materials?" For one thing, it has been necessary to go farther to secure some of these raw materials, and this is reflected in increased transportation costs. Then, too, in some instances the substitute materials which have been resorted to have been more expensive. It is not difficult to find the reason for the increases in the per-ton labor cost, in light of the great amount of penalty overtime made necessary because of the man-power shortage. Other factors and equally sound reasons account for all of these increased costs.

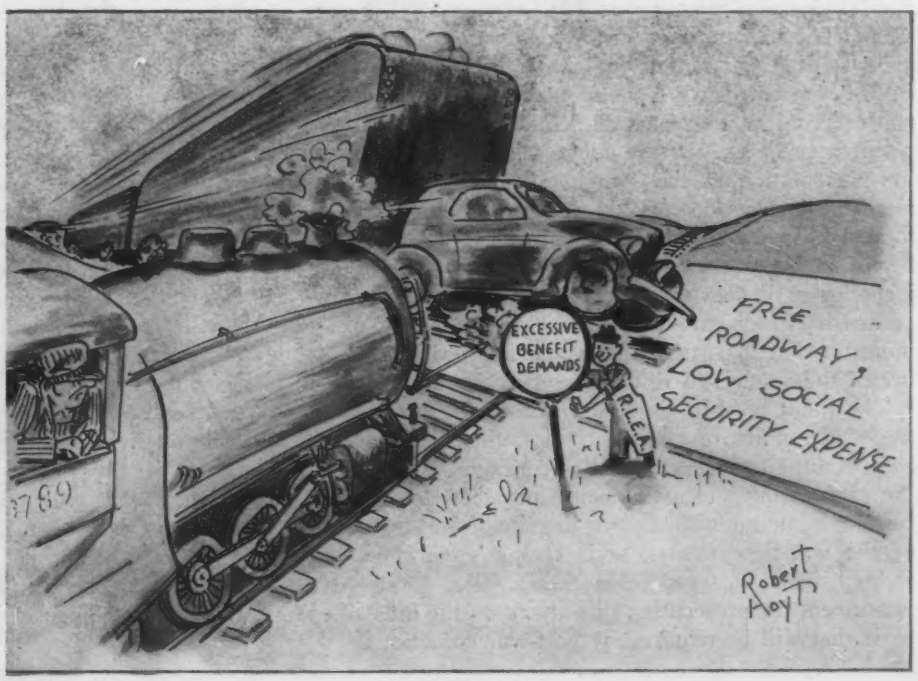
If all the brake shoe plants were placed on a 40-hour work week, without overtime, it would be impossible to meet the demands for their products and railroad operation would be retarded; this is unthinkable in light of the strategic importance of railroad transportation in the war effort. While it is conceded that if the plant which has operated at a loss for three years were closed, railroad transportation would be retarded, the O. P. A. has insisted upon maintaining the present ceiling prices, because it has contended that they are not retarding the war effort.

Other railway supply manufacturers are experiencing the same difficulties. They are apprehensive, also, of what may happen if the present prices are continued into a period of lower production, without adjustments to insure keeping out of red ink figures. Here is a field for the most critical research. If price controls continue into the post-war period, obviously adjustments must be made if we are to insure healthy industrial organizations which can continue to furnish stable employment.

A. R. E. A. and Research

In common with other organizations of railroad men, the American Railway Engineering Association has been conducting its work during the war years in the face of severe handicaps and difficulties. Always hard

Boosting Employment for Truck Drivers



put to keep abreast of the exacting demands of their work, members of this association have, during the war years, found themselves under greater pressure than ever, with the result that, for many of them, the amount of time that could be devoted to the work of the association has had to be greatly curtailed. Also, during two of the war years, 1943 and the present year, the cancellation of the annual meetings deprived the association of one of the first essentials to a healthy, active organization, thereby requiring that the members carry on their work without the aid and inspiration that, in normal times, are afforded by the opportunity of meeting as a group once each year for the exchange of ideas and information.

Nevertheless, reflecting the inherent vitality of the A. R. E. A. and the essential nature of its work, the war-time record of the association is one of continued progress and achievement. True enough, that phase of the work of the committees that is dependent on voluntary contributions of their own time by the personnel has suffered somewhat as a result of the increased preoccupation of the members with their regular duties.

Obviously, this trend of events is an unavoidable concomitant of the unusual conditions prevailing. But it represents a temporary retreat in one sector that has been more than outweighed by a permanent gain in another, namely, in the form of a compensating increase in the amount of research work that is being conducted under the auspices of the association with the aid of paid investigators.

Two yardsticks are available for measuring the extent of the increase that has occurred in the amount of research work that is carried on by the association, both of which are discussed in the reports by F. R. Layng and W. S. Lacher, president and secretary, respectively, of the A. R. E. A., that are included in the Convention-in-Print section of this issue. One of these is the increase that has taken place in the dollar value of the annual allotments for research that are made by the A. A. R. to its Engineering division (A. R. E. A.). For 1943 the allotment was $98,542, for 1944 it was $109,050, and for the present year it is $138,110, an increase of 40 per cent as compared with 1943.

The other yardstick is the number of pages of printed matter required to report the findings of the various research projects. In the committee reports prepared for presentation at the March, 1944, convention, the number of pages comprising data on research studies totaled 140; in the year ending March, 1945, the number of such pages increased to 484. The latter figure, including as it does the reports on two unusually comprehensive investigations, is something less than an exact indicator, but it is, nevertheless, an approximate measure of the amount of research work being done.

The point of this discussion is that, by broadening the scope of its research activities, the A. R. E. A. has obtained the wherewithal to continue its attack on the engineering and maintenance problems of the railroads with undiminished vigor in spite of the adversities of the war-time period, and, at the same time, has created, in its enlarged research activities, an effective instrument for prosecuting this attack on the intensified basis that will be required by post-war conditions.

A Case of Buying and Selling

The American people have been subject to such floods of idealism during recent years that one who undertakes the development of new products to meet a need which insures a market is fortunate if he is not regarded as a public enemy because his immediate business objective is a profit. It is refreshing to find an occasional forthright believer in the processes by which America was built who sees nothing in the commercial processes and motives by which advances have been made concerning which a shamed silence should be maintained.

In an article on another page in this issue the author refers specifically to the steps by which the commercial development of low-alloy high-strength steels was accomplished. Within the five years following the year of introduction of one of these steels more than 20 per cent of the freight cars built employed the new material in whole or in part in their construction. Adding the substantial number of cars built of other high-strength steels during these same years, a good job of selling and a speedy acceptance are clearly indicated.

Despite these facts, however, there are those who still believe that the response of the railroads to the weight-saving materials has been too slow. Those so disposed should recall that the rate of progress actually made was in the face of competitive handicaps of no mean proportions. In the first place the economics of weight reduction were not and, indeed, have not yet been stated in such a way that the results in specific instances are not still clouded with doubt. During the early period of rapid installation the question of relative durability of such cars was yet to be determined. Now, with ten years of service behind a considerable number of cars employing most of the materials permitting lightweight construction, a generally satisfactory record has been established. The limitation placed on weight reduction by the single capacity brake is another handicap to which the materials for lightweight construction are subjected. This has restricted payload-gross-load ratios to 75 per cent which could have been carried to upwards of 80 per cent. A prospective load compensating brake will partially remove this limitation—partially because of some additional cost for the new brake.

Another factor in the competition of materials is relative price—not necessarily the per pound price of the material but the relative price of the finished cars. Should the price differentials of the materials suitable for lightweight construction be sufficiently small after the war so that the reduced poundage would offset the increased price per pound, price would cease to be a detrimental competitive factor. Even if this is not the case, the urge toward faster freight-train operating speeds will undoubtedly tend to increase the value of a saved pound of car weight.

These are the primary factors likely to affect the competition of car-construction materials after the war. The problem is not primarily technological. It lies within the field of the interplay of the self interests of sellers and buyers. The results depend upon the degree of farsighted intelligence with which these interests are controlled.

K. C. S. Speeds Its War-Time Traffic

C. T. C. project between DeQuincy, La., and Beaumont, Tex., 46 miles, saves 40 minutes for each freight train

THE Kansas City Southern has recently installed centralized traffic control on 46 miles of single track between DeQuincy, La., and Beaumont, Tex., this being a portion of the main line between Kansas City, Mo., and Port Arthur, Tex., with Beaumont 19.5 miles north of Port Arthur. The operating division of the K. C. S. is between Port Arthur and Leesville, La., 117 miles. This 46-mile section of the Kansas City Southern between DeQuincy and Beaumont is used also by trains of the Missouri Pacific on the route between Houston, Tex., and New Orleans, La., with connections through Alexandria, La., to Missouri Pacific lines to St. Louis, Mo. The operating engine district on the Missouri Pacific is between DeQuincy and Houston, 136 miles.

On the 46 miles between Beaumont and DeQuincy the line is tangent except for one 1-deg. curve, only 400 ft. long, near the south end of Starks. For all practical purposes of train operation, the line is level, at an elevation ranging from 24 ft. above sea level at Beaumont to 85 ft. at DeQuincy. The maximum permissible speed limit is 60 m.p.h. for passenger trains and 50 m.p.h. for freight trains using locomotives with 63-in. drivers, or 40 m.p.h. using locomotives with drivers less than 63 in. The lengths of the trains depend on the commodity and locomotive being used, but most of the locomotives used by both the Kansas City Southern and the Missouri Pacific will handle about 5,000 tons, which generally averages about 90 cars.

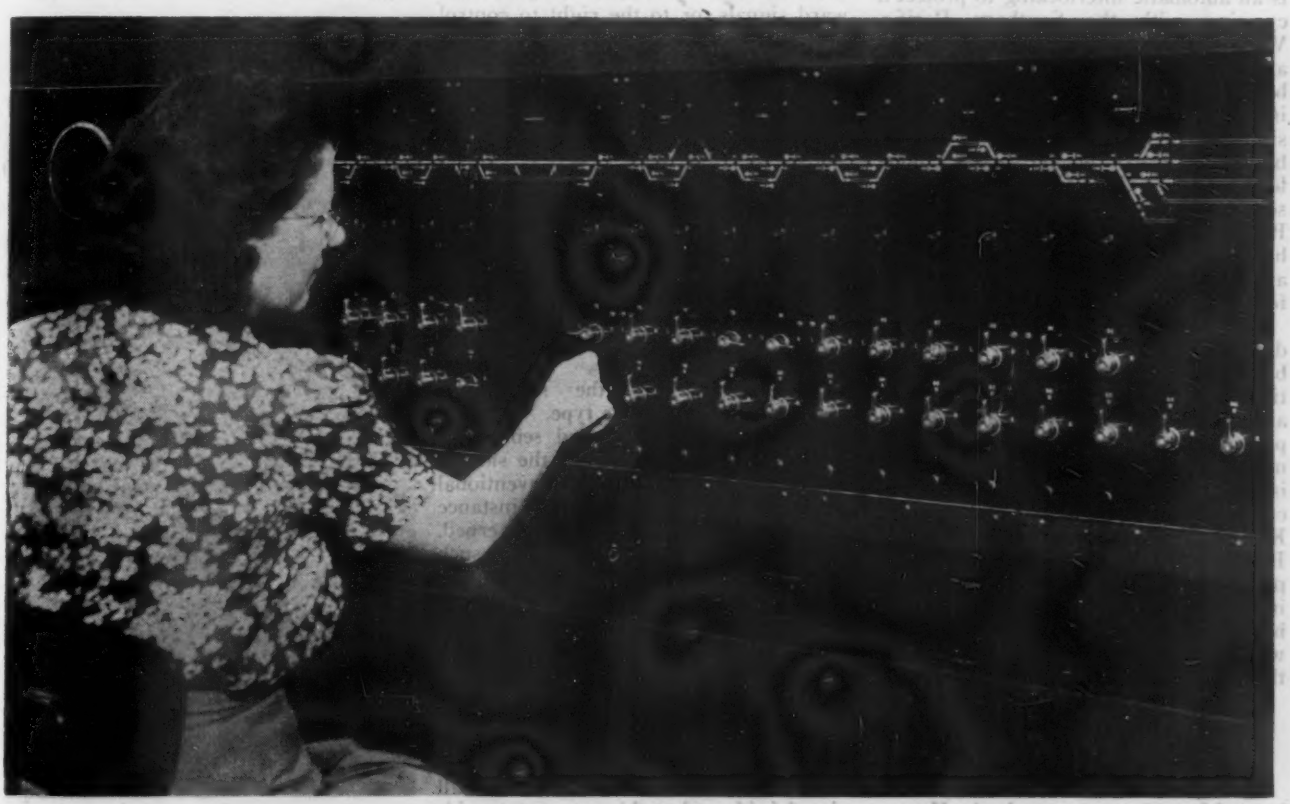
The Kansas City Southern operates two passenger trains daily and the Missouri Pacific operates four. On an average day in January, the Kansas City Southern operated 8 freight trains and the Missouri Pacific 21. This total of 35 trains is less than the normal of 40 to 45 trains operated on many days. During the earlier part of the war as many as 60 trains a day were operated over this territory.

Junctions and Sidings

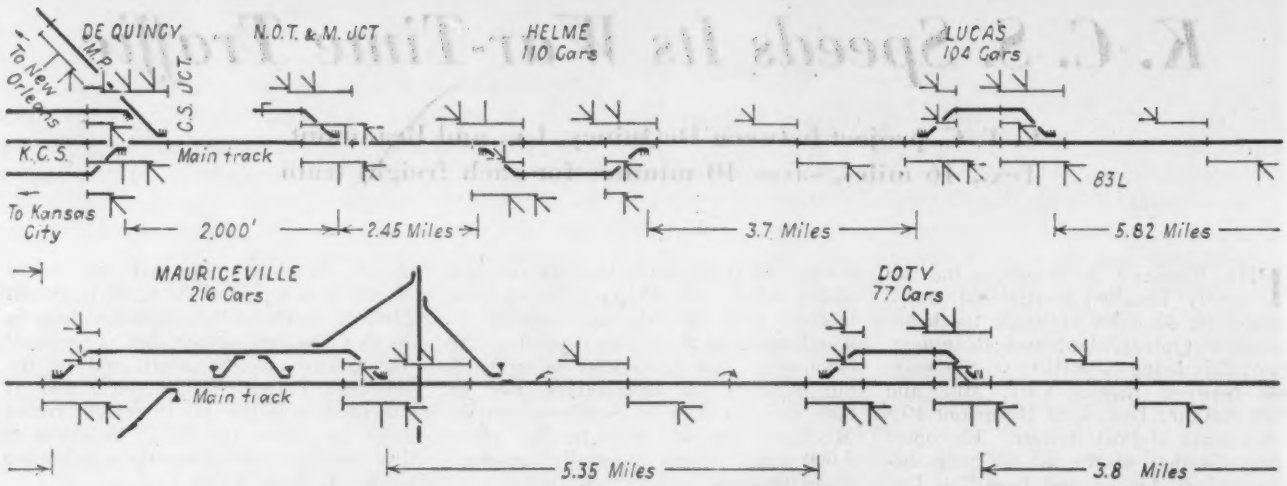
At DeQuincy the Kansas City Southern has two sidings, one on each side of the main track. The Missouri Pacific main track connects with one of these turnouts, thus making a junction with the K. C. S. main track at C. S. Jct., as shown in the diagram. These three switches are equipped with power machines as a part of the C. T. C. About 2,000 ft. south of this junction there is another power switch for a turnout which leads to the south end of the Missouri Pacific freight yard, and as a general rule the M. P. freight trains enter and leave the K. C. S. track at this switch, which formerly was known as N. O. T. & M. Jct.

Between DeQuincy and Beaumont there are seven sidings at: Helme, Lucas, Starks, Ruliff, Mauriceville, Doty and Vidor. The end switches at all of these seven sidings were equipped with power switch machines as a part of the C. T. C. project. The track capacities of the sidings are marked on the diagram. The sidings at Mauriceville and Vidor are long enough to hold two trains if necessary, and a set of two crossovers was formerly in service at the center of each siding so that trains could enter or leave at these center crossovers. It was decided that, with the C. T. C., there would be no need, ordinarily, to use these center crossovers, and, therefore, the hand-throw stands were left in service and were equipped with electric locks.

The Missouri Pacific has a short



The Control Machine Is in the Office at Beaumont



Track and Signal Plan of the C. T. C. Territory Between Beaumont, Tex., and DeQuincy, La.

secondary line which extends from a gulf port at Orange, Tex., to Newton, and this line crosses the K. C. S. at Mauriceville. A mechanical interlocking, to protect this crossing, is normally lined for the K. C. S. The old mechanical home signals were replaced by color-light signals to conform with the other new ones and these new home signals serve as both interlocking and C. T. C. signals. The leverman at Mauriceville cannot clear one of these signals unless C. T. C. control has been sent from Beaumont. Space was left on the new C. T. C. machine to add levers later if desired to control this entire interlocking at the Mauriceville crossing.

Between Vidor and Beaumont there is an automatic interlocking to protect a crossing with the Southern Pacific. West of this crossing the K. C. S. has a lift bridge over the Neches river, this being protected by a separate electric interlocking. The northbound home signal at this bridge cannot be cleared by the leverman on the bridge interlocking unless C. T. C. control has been sent out from the C.T.C. machine at Beaumont. Therefore this northbound home signal at Neches River bridge is also the entrance to C. T. C. territory for northbound trains.

The speed limit over the Neches River drawbridge is 25 m.p.h. From this bridge on south to the Beaumont station the tracks are in a paved street, and all trains are required to stop and be preceded by a flagman over five of the main street crossings, so that the speed is about 10 m.p.h. The junction switch connecting the Missouri Pacific to the Kansas City Southern just south of the Beaumont station is equipped with a power switch machine and signals forming an interlocking, which is controlled by a separate machine in the same room with the C. T. C. control machine in the office at Beaumont.

The C. T. C. Control Machine

The new C. T. C. control machine is located in a separate room in the Kansas City Southern station at Beaumont, a picture of this machine being shown herewith. The illuminated track and signal diagram includes lamps which repeat the occupancy of all sections of main track. One lamp repeats the occupancy of the OS section at each power switch, one lamp repeats each section of main track opposite a siding and one lamp repeats the occupancy of each station-to-station block. The man in charge of the C. T. C. machine has a fair knowledge of the location of a train in a station-to-station block because a C. T. C. indication code cycle is sent in when the front or the rear of a train passes an intermediate signal location.

The signal levers, which are in the top row, normally stand on center and are thrown to the left to control southward signals, or to the right to control northward signals. A lamp in the barrel of each lever is lighted when the corresponding signal has cleared. The switch levers, which are in the second row, normally stand vertically, and are operated 90 deg. to the right to reverse the corresponding switches. When a lever is thrown a lamp in the barrel of the lever is lighted until the switch is over and locked in the position corresponding to that of the lever.

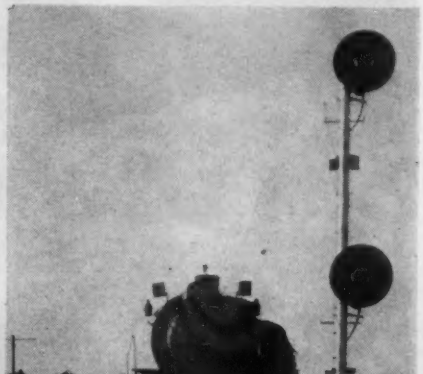
Layout of Signals

The signals are the searchlight plug-in quick-detachable type. The layouts of C. T. C. controlled semi-automatic signals at the ends of the sidings are in accordance with conventional practice, the signals in each instance being at the right of the track governed. When the siding is not involved, such as at the south end of Lucas, the station-departure signal is a high signal. In contrast, the northward station-departure signal at the north end of Lucas is a dwarf signal, this type of signal being used because it could be located between the main track and the siding without throwing the siding over to provide clearance for a high signal. Another method would have been to install signal bridges, but this was not considered because of the desire to conserve steel and thereby aid in the war program.

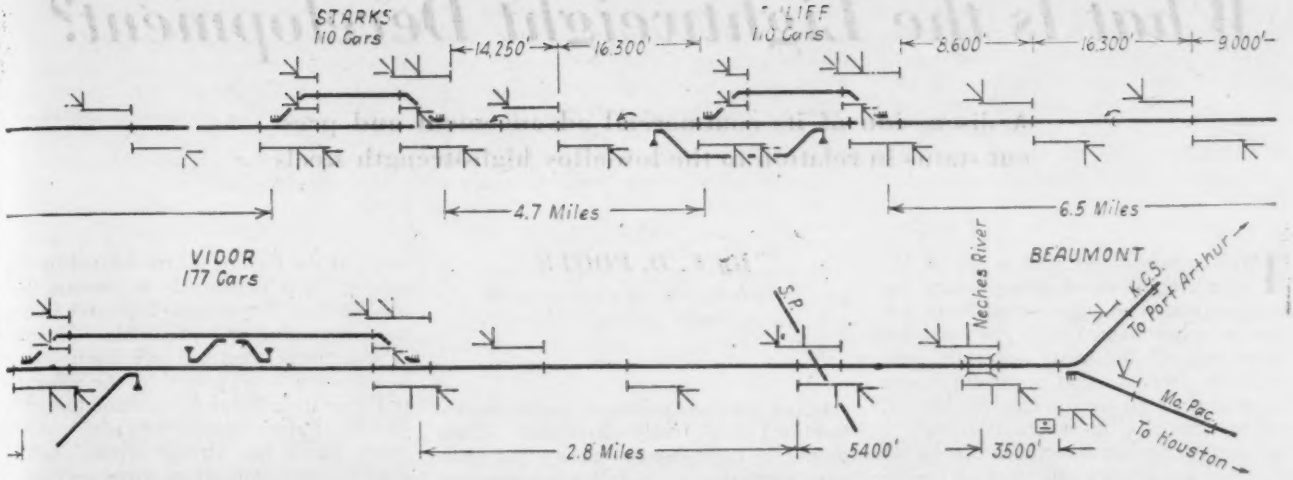
The C. T. C. controlled station-entering signals at the ends of the sidings each have two operative searchlight heads, the lower one being used to display yellow under red in the upper unit to direct a train to enter the siding. The northward signal at C. S. Junction has three operative units on account of the number of routes involved. A main line station-leaving high signal, such as signal 83L at Lucas, has a searchlight head for the upper unit, but the lower unit consists of a reflectorized marker with a standard sized background shield. This marker is used to complete the standard K. C. S. aspect of two units for an absolute stop high signal.

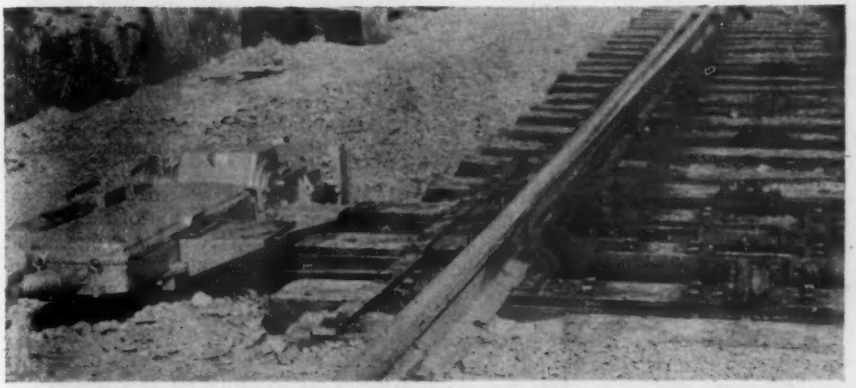
Switches Well Constructed

As a part of the improvements, new 112-lb. rail with No. 18 turnouts including 30-ft. points, was laid at the ends of the sidings to replace No. 10



Northbound Train at North End of Ruliff





The Power Switch Machines Are of the Dual-Control Type

turnouts and 85-lb. rail. The new rail extends throughout the OS track circuits so that no changes in insulated rail joints will be required when the 85-lb. rail is changed out on the remainder of the main line, this change being scheduled for 1946.

The electric switch machines are the Model 5D, equipped with dual-control and motors for operation on 24 volts d-c. At each switch there is a 1-in. by 8-in. insulated gage plate on the tie ahead of the points. On the next two ties, 1-in. by 8-in. cut plates extend out under the switch machine so that there is no lost motion between the rails and the machine. Racor adjustable rail braces are used on the plates on three ties.

Previous Operation

Under the previous operating practice, the train movements were authorized by timetable and train orders, no automatic block signaling being in service. Operators were on duty at C. S. Junction near DeQuincy, at Lucas, Starks, Ruliff, Mauriceville, Vidor and Beaumont. Also a switchtender was on duty part time at the G. C. Jct. switch just south of the station at Beaumont. The office at Beaumont has been retained, but the other train order offices have been abandoned except that the Missouri Pacific retains a day-trick agent at Mauriceville.

Prior to the war one set of dispatchers at Shreveport, La., handled the division between Shreveport, La., and Port Arthur, Tex., of which the DeQuincy-Beaumont section is a part. Because of the extra traffic caused by the war two sets of dispatchers were placed at DeQuincy, one set working from DeQuincy north to Leesville, and the other set from DeQuincy south to Port Arthur. At that time the total number of train movements varied from about 50 to 60 daily over the joint track. As the traffic decreased gradually to about 35 to 40 trains daily, and as the centralized traffic control eliminated the use of train orders on the DeQuincy-Beaumont section, one set of dispatchers at DeQuincy now handle the division between Leesville and Port Arthur, and the control operator, in charge of the C. T. C. machine at Beaumont, works under the general supervision of the dispatcher at DeQuincy.

Previously when authorizing train movements by timetable and train orders, the general policy was to use meet orders. With trains feeding in from two railroads at DeQuincy as well as at Beaumont the trains lost a lot of time at meeting points, simply because various local circumstances prevented trains from entering the territory at the time previously given to the dispatcher when issuing the orders. Oftentimes trains would wait for an hour or more on sidings when waiting for meets, according to orders. As a result this 46 miles between DeQuincy and Beaumont was the seat of numerous delays, thus disrupting the operations of trains on the entire operating divisions of both the Kansas City Southern and the Missouri Pacific.

Electric Switch Machines

With the centralized traffic control the indicators on the machine show the progress being made by the trains on the line so that they can be directed by signals to keep moving, and to take siding for meets on very close timing. At the longer sidings at Vidor and Mauriceville non-stop meets between trains are made most every day. Furthermore with the C. T. C., when trains are ready at DeQuincy or Beaumont, they can be directed by signals to depart at once, in most instances rather than waiting for orders. The electric switch machines at the sidings make it possible for a train to move out of a siding and then on the main line to another station and enter the siding there, in about 10 to 15 minutes less time than if hand-thrown switch stands were still in service. This time saving makes it possible to advance a train in numerous instances when otherwise it would have to be held back.

Average 40 Min. Saving

The division superintendent and the train dispatchers made a detailed analysis of the train operations on typical days before and after the C. T. C. was in service. The conclusion was that, on the average, the through freight trains were saving about 40 minutes.

This centralized traffic control project was constructed by forces of the Kansas City Southern under the direction of C. F. Grundy, signal engineer. The principal items of signaling equipment, including the C. T. C. control machine and line code system, were furnished by the General Railway Signal Company which also prepared the circuit diagrams.

What Is the Lightweight Development?

A discussion of its commercial advancement and present status in relation to the low-alloy high-strength steels

By F. D. FOOTE
President, Alloys Development Company, New York

THE potentialities and scope of the light weight development excite the imagination. The engineering feats that can be accomplished with the superior properties of the new materials now available, indicate that a careful re-examination of all equipment, machinery, and structures is in order. It is safe to say that all mobile structures can be redesigned for greater efficiency of operation, with equal or longer service life, and that this can frequently be accomplished without any increase in initial cost. Many structures which do not move in transportation, but have moving parts, can be improved likewise—structures such as loading devices, road building machinery, agricultural implements, gates for dams and locks, mine skips, and so on. Also, static structures whose components must move great distances to reach their ultimate destination, perhaps in export to remote parts of the world where transportation facilities are inadequate, and handling charges very costly. Bridges and buildings may often be improved substantially, and reduced in cost, through proper employment of these new steels.

This has been discovered already to the profit of our foreign competition in Great Britain, France, Belgium and Germany. I believe that, in view of the great strides now being made in chemistry and metallurgy, design ingenuity, and fabricating techniques, all structures built in the future could make use of these new materials with such excellent results that a major part of existing structures would either be rendered obsolete, and subject to prompt replacement, or so outmoded that their days would be numbered and the time of their retirement advanced substantially. Herein lies a great opportunity for private industry and greater employment of labor.

Proper Material Allocation

Are we going to have constructive competition, and cooperation among the producers of the new materials, in order that these important objectives may be realized and the fullest advantage taken of the enormously expanded capacities for their production? If so, each type of material must find its proper application and thus promote its own greater use and, at the same time, avoid stepping in the way of a more worthy product. To achieve a modest approach to such an ideal state of affairs, producer interests and common problems should be determined and freely discussed. They should be tackled with energy and genuine enthusiasm. A full consciousness of the benefits which may be enjoyed through the employment of these new and superior materials will scarcely be brought about if we are to be content merely to catalog their properties, and the various forms in which they can be obtained, and let it go at that! We must study the functions of the structures which we would improve, to determine where each particular material will best do a job, and then carry a sound and convincing argument to the owners and operators by rendering to them an intelligent and helpful engineering service.

But this is step No. 2. First we must create an interest on the part of the owners and operators. All of us who are bent upon finding markets for improved materials must join in a crusade to determine and publicize the economies which their employment will effect. How much weight saving can safely be secured under the conditions of the service to be performed, and what initial cost can be justified? Proper design and proper selection of materials will be based upon honest and intelligent answers to these questions. It is almost trite to say that in the long run the materials best suited to a given service will prove the most economical in that service, and the quicker steel discovers where it cannot compete with the non-ferrous metals, and vice versa, the quicker will both forge ahead toward maximum employment. So, it is gratifying indeed that the railroads, which constitute one of the greatest potential markets in the transportation field, are now conducting a thorough study of the economies of weight reduction in rolling stock, under the auspices of the Association of American Railroads. It is well that they are, because according to statistics reported by the American Railway Car Institute, 539,000, or 30.7 per cent of the freight cars owned by Class I railroads are over 25 years old. Another 299,000, or 17 per cent, are 21 to 25 years old. By the time the older cars have been retired and replaced with new equipment, the second group aged 21 to 25 years will be good subjects for replacement, and another 365,000 cars, or 21 per cent, now in late middle life will be creeping up to retirement age. Considering the rapidly accelerating progress now being made in all of the technical arts related to our subject, it is reasonable to assume that obsolescence has become a greater factor in determining the profitable life span of equipment than old age itself. This observation is supported by the substantial operating economies made possible by the lighter, more efficient rolling stock which has already given such a good account of itself in actual service.

It is said that it takes seven years to get under way with any new development in the steel industry, or with the railroads. If this is true, a new record has been hung up, because, during the five years 1935 to 1939 inclusive—a period commencing just one year after these new steels were introduced—35,027 of a total of 152,108 new freight cars, installed by Class I railroads, were built wholly, or in part, of one of the leading high-strength steels of this group. This comprises 23 per cent of the new equipment installed, and the cars were distributed over 24 Class I railroads. Over this same period, with 1940 added, 7,117 new, light-weight freight cars of various types, were installed on 18 Class II and III railroads, private lines, and, through export, on foreign lines.

Research — Merchandising

The low-alloy high-strength steels were created initially for the transportation field. Some years ago a survey of leading engineers in this field disclosed a growing consciousness of excessive dead weight in transportation equipment. These engineers were asked what was required in the way of superior properties to provide lighter and more efficient designs, while at the same time sacrificing nothing in maintenance costs or the service life of the equipment. Their requirements were almost identical. They wanted greater strength to permit a substantial increase in unit stresses, and thereby make possible a proportionate decrease in section modulus. This meant the employment of lighter gages and, consequently, their next demand was for a greater degree of resistance to corrosion in order that the rate of attack would be retarded to a point equivalent to the reductions made in the sections employed. Next they required a composition that could be formed easily, hot or cold; readily welded without heat treatment, and generally without the need of subsequent annealing, or stress relieving. It was essential also that these properties should be provided in the as-rolled condition of the steel, because it was obvious that such large structures as railroad freight and passenger cars, street cars and

This article is an abstract of an address before the New Jersey Chapter of the American Society for Metals at Newark, N. J., on November 20, 1944.

barges could not be subjected to heat treatment after fabrication. Lastly, it was asked that all of these superior properties should be integrated in a steel of relatively low cost. Added up, this seemed quite a large order, and it proved to be, but the market-building possibilities were so clearly indicated that they provided a sufficient spur to the ingenuity of the metallurgists, and thus this new type of steel was created.

The sequence and character of the efforts made in promoting the development, are most important and interesting. These, named in their proper order, were: Commercial research to determine the market-building possibilities and the medium by which the steel industry could profit by these possibilities. Having thus determined that a superior grade of structural steel was indicated, technological research was presented with the task of developing such a composition. Then having succeeded in obtaining and thoroughly testing such a superior steel, it was introduced by sales promotion, aided by engineering service, and advertising. By these means the economies which the desired market could enjoy through the adoption of modern steel designs were explained, and in this manner the lightweight development in the transportation field was born.

Concerning Low-Alloy Steels

Recently a definition of steel compositions which qualify as low-alloy high-strength steels has been promulgated. This definition specifies the following:

The term "low-alloy high-strength steel" is meant to include steels to which moderate amounts of alloying elements have been added, imparting in the as-hot-rolled condition a yield point of 50,000 lb. per sq. in. minimum, in sections ½ in. thick and lighter, and which experience indicates will result in atmospheric corrosion resistance four to six times that of mild steel.

The degree of corrosion resistance specified is determined by unstressed samples exposed for long periods of time in industrial, rural, coast-wise, and other atmospheres. This atmospheric corrosion resistance of four to six times mild steel has resulted in added service life of coal-carrying equipment equivalent to approximately two and one-quarter times the service life of similar equipment built of equal section in ordinary steel. Many corrosion tests of some of these steels have now been carried on in this country for a period of ten years and longer. Several abroad—notably those instituted by the Corrosion Committee of the British Iron and Steel Industries—have run for more than five years. The British tests were conducted in various industrial atmospheres in the British Isles, and in various other atmospheres throughout the Empire, including those of both the Temperate and Tropical Zones.

The added per-pound cost of the new steels, when compared with the cost of ordinary carbon steel, is about in the ratio of their yield points. Hence, the unit cost of the lighter structures employing high-strength steel is frequently no more than that of similar structures in ordinary steel. When the fabricators have become thoroughly familiar with the use of these steels in the different structures which they produce, there would seem to be little doubt that the unit cost of the improved structures will be lowered substantially. Consequently, the very substantial savings to be enjoyed by the owners who operate the modern equipment should be obtained free of cost.

Examples of Weight Saving

A standard A. A. R. box car in carbon steel weighs about 45,000 lb. Box cars of the same inside dimensions and identical equipment, built of all-welded high-strength steel, weigh about 36,000 lb.—a saving of 4½ tons per car.

A standard A. A. R. hopper car on 50-ton trucks in ordinary steel weighs about 42,000 lb. Modern light-weight hopper cars providing increased pay load capacity, equal to the amount of weight saved, can be built to weigh 32,000 to 33,000 lb., using standard A. A. R. specialties. These cars would have a life expectancy equal to or longer than that of the heavier designs built of ordinary steel. In 1935 115 extremely light hopper cars were built on 50-ton trucks which weighed only 30,500 lb. All of them were placed in operation late in that year on four different railroads, and are just completing ten full years of service. The side and end sheets of the cars, and also the upper slope floor sheets, were 3/32 in. thick, as compared with a normal thickness of 3/16 in. in carbon steel. The lower slope floor sheets were ⅛ in. thick and the hopper sheets 5/32 in., as compared with normal thicknesses in carbon steel of ¼in. and 5/16 in. One hundred of these cars have been used in coal and ore service requiring them to pass through car dumpers at the end of each trip. An inspection report at the end of nine years of service gave no indication of a time when the cars would need to be shopped for heavy repairs! These cars were designed with a capacity to carry six additional tons of coal, when compared with conventional carbon-steel cars of standard A. A. R. design.

Increased Safety Factor

The weight of a main-line passenger coach was formerly about 80 tons. Cars built in the past ten years of high-strength steel and all-welded design, and with the same seating capacity, average about 55 tons—a saving of 25 tons per car, including the extra weight of air conditioning. This saving in weight is accomplished at no sacrifice in car life or safety. In fact, due to design improvements, all-welded construction, and the use of high-strength steel, the new cars have an increased safety factor over the older and heavier ones. This increased safety has been measured by tests and also by the behavior of the cars themselves in road accidents.

Modern Pullman cars have employed low-alloy high-strength steel in their outside sheathing and stress-carrying members. Their smooth appearance is due to their all-welded construction. Because of their lighter weight, longer trains can be carried with the same motive power.

It is interesting to note how weight saving spirals in these new passenger-car designs. Because of the substantial reduction made in body weight, it is possible to employ four-wheel trucks in place of the six-wheel trucks previously required to operate the older and heavier cars. This eliminates one-third of the wheels employed per car, and contributes handsomely to the overall reduction in weight. In general, the re-design of all types of structures for the use of high-strength materials result in such multiplications of weight saving from top to bottom.

Some structures to which low-alloy high-strength steels have been applied, other than in railroad cars, are as follows:

The capacity of a mine skip was increased from 7½ to 10 tons of coal without increasing the load on the hoisting equipment.

Fifteen Tainter gates each 75 ft. in length (longer than any similar gates previously constructed) were used in a dam in the Mississippi river. These lighter gates made possible a substantial decrease in the weight of the lifting chains, operating machinery, and supporting structures.

Sound Engineering

On an all-welded barge ¼-in. high-strength steel side and bottom plates were substituted for the 5/16-in. plates formerly used, and 3/16-in. bulkhead plates for ¼-in. These reductions afforded an increased load capacity. A derrick mounted on the deck of this barge had a 40-ft. boom of high-strength steel which was lighter than the wood boom previously used.

High-strength steel was used in the design of a number of highway trailers constructed for the transportation of automobiles. A weight saving of 1,200 lb. per unit was achieved, effecting substantial reductions in operating costs.

A substantial increase was needed in a side-wall coal loading machine located at Hampton Roads, Virginia. The piling under the pier was already loaded to capacity. The necessary weight saving was accomplished through the use of high-strength steels, thus avoiding a costly reconstruction of the pier itself.

Many other interesting examples could be cited, but those referred to should suffice to indicate the potentialities of this new development. What it adds up to in simple terms is that through the lightweight development we are trying to do a modern job of merchandising, based upon superior materials and sound engineering, generously spiced with imagination!

COMMUNICATIONS . . .

Time to Reduce Refrigerator Car Weight

SAN FRANCISCO

TO THE EDITOR:

John M. Kelley's article in the February 10 issue of the *Railway Age* on "Perishable Transport of the Future" is interesting but disappointing in that it fails to touch on a very important point to carriers and shippers, to wit: the urgent necessity of reducing present tare weight of refrigerator cars.

Average light weight of a standard refrigerator car has increased about 4,000 lb. in the past 20 years, with little, if any, increase in the cubical loading capacity. With the increasing use of fans and other devices, unless some method is developed to stop this trend, there will be still further increased light weight. The importance of reducing light weight of refrigerator cars is hardly second to reducing light weight of passenger cars. Unlike other types of freight equipment, refrigerator cars are almost constantly in motion and run up great mileages through their lifetime. There is little likelihood in normal times of appreciably increasing average loading. Commercial trade conditions, to say nothing of truck and water competition, will preclude such increase. We must anticipate a considerable decline from the present compulsory high loading.

Importance to Industry

The average haul on transcontinental fruits and vegetables is about 2,500 miles. In excess of 80 per cent of these cars are returned empty. They should average at least six round-trips a year. If our mechanical engineers would devise a standard refrigerator car weighing 20 per cent less than the present standard refrigerator car, we would have a car of about the same tare weight as a 50-ton capacity 50-ft. automobile car without inside equipment. It would reduce the average weight more than five tons. In the refrigeration case back in the 'twenties the Interstate Commerce Commission found that the added cost of handling additional weight of ice in a refrigerator car was three-fourths of a mill per ton-mile (railroad cost accountants correctly contended that the cost was considerably greater). Subsequent wage increases and other increased costs should make the Interstate Commerce Commission figure at least one mill per ton-mile.

Having the foregoing in mind, the following tabulation indicates the importance to industry and carriers of materially reducing light weight of the standard refrigerator car:

Average transcontinental loaded haul	2,500 miles
Empty haul (80% of loaded)	2,000 miles
Total mileage per trip	4,500 miles
Six trips annually	27,000 miles
Cost of hauling 5 non-revenue tons at one mill per ton-mile	$135 per annum
Equals 3% on a	$4,500 investment

As money for improved refrigerator cars can probably be obtained for less than 3 per cent, it should be quite obvious that there is a very profitable field to the carriers in increasing the initial cost to secure lighter-weight cars.

Approached from the shippers' angle, a reduction of five tons in the light weight of a car which moves on an average for each transcontinental trip 4,500 miles, and assuming cost of hauling added weight is only one mill per ton-mile, there would be a saving of $22.50 per trip. Taking the average loading of 17.86 tons for fresh fruits and vegetables cited by Mr. Kelley, this would be $1.26 per ton of revenue freight. The average transcontinental freight rate on fresh fruits and vegetables is probably less than $30 per ton. Hence the reduction in cost by a five-ton reduction in light weight of the standard car would be equivalent to not less than 4.2 per cent of the average freight rate.

With the return of more normal average loading in the post-war period, we may anticipate an average load of transcontinental fresh fruits and vegetables of not over 15 tons. Hence, looking to the post-war period, a five-ton reduction in the light weight of standard refrigerator cars would be equivalent to $1.50 per ton reduction in the cost of handling the paying load, or 5 per cent of the average transcontinental freight rate.

While shippers' freight costs are not so important under present conditions, it should be obvious to everyone that in the post-war period, with a decline in wartime demands and increasing unregulated trucking in the fruit and vegetable industry, there will be a tremendous demand both from the rail shipper and railroad point of view for increased speed and reduced cost to enable the long-haul shipper to remain profitably in the major markets against the unregulated truck operators. There will also be a need for lesser average loading. Hence there is no more important problem confronting the perishable fruit industry as a whole, whether it be the shipper or the railroad, than reducing the non-revenue weight hauled.

Trend in Freight Equipment

At times it seems that car designers and others in late years are paying little, if any, attention to the importance of keeping down the weight of freight equipment. The light weight of a standard refrigerator car has gone up about 10 per cent with no appreciable increase in space loading capacity. One shudders when he thinks of the weight of the so-called giant cars, 65,000 lb., and jumbo cars, 87,000 lb. This trend seems to appear in other types of freight equipment. One hears of specially designed tank cars weighing over 110,000 lb.; special equipment in box and gondola cars that increases the light weight from 10 to 35 per cent. In most instances these increased weights are to reduce the necessity of packaging and dunnage, with consequential loss of freight revenue earned thereon. Yet nowhere do we see any appreciable effort by carriers or willingness on the part of shippers to pay increased freight rates to cover cost of increased non-revenue weight and decrease in revenue load, to say nothing of the additional investment.

H. C. HALLMARK
Freight Traffic Manager, Southern Pacific

Charting Depreciation

CHICAGO

TO THE EDITOR:

In the February 17 issue of *Railway Age*, page 349, G. B. McMillen erroneously interprets my plan of charting depreciation data (see *Railway Age*, January 27, page 239) as "the turnover method." Aside from the basic installation and retirement curves there is little similarity in the two methods.

The turnover method derives its name from its objective—that of measuring the duration of a complete life cycle or turnover period. It measures the length of the period, not the average retirement age within the period. Its sole purpose is to determine a single factor which more often than not needs modification for future use. Naturally application of the turnover is very limited.

My method establishes a well defined trend curve which by inspection can be projected into the future. By applying the ages disclosed by the chart, it is possible to determine the total accruals on valuation date or any date subsequent thereto. My method can be applied accurately to a property group, primary account or to the combined total of investment in road and equipment. It follows the investment accounting records and automatically takes care of all price changes, replacements in kind, and other matters which affect the ultimate amount which eventually must be charged to the cost of operation. It is not distorted by premature or delayed retirements of the individual units of property.

The normal rate of retirement is found by comparing the costs actually retired, within a certain period, with the total investment at the beginning of that period. The costs actually retired establish the rate of retirement. For example: if ten dollars out of one hundred are retired, the rate of retirement is 10 per cent and the normal average age corresponding to that rate is 10 years. No other age will produce that rate. So the retirement age of the individual dollars (or units) is unimportant —the relation of bulk retirements to bulk investment determines the composite rate absolutely. Conversely, the individual ages of retirements are not a factor in determining the normal rate.

Failure to recognize the soundness of the first-in-first-out principle has led to tremendous amount of needless work in collecting unit data. But even more serious is the fundamental error inherent in most unit methods which consistently indicates a longer life than is warranted by proper analysis of the facts.

H. J. Dow

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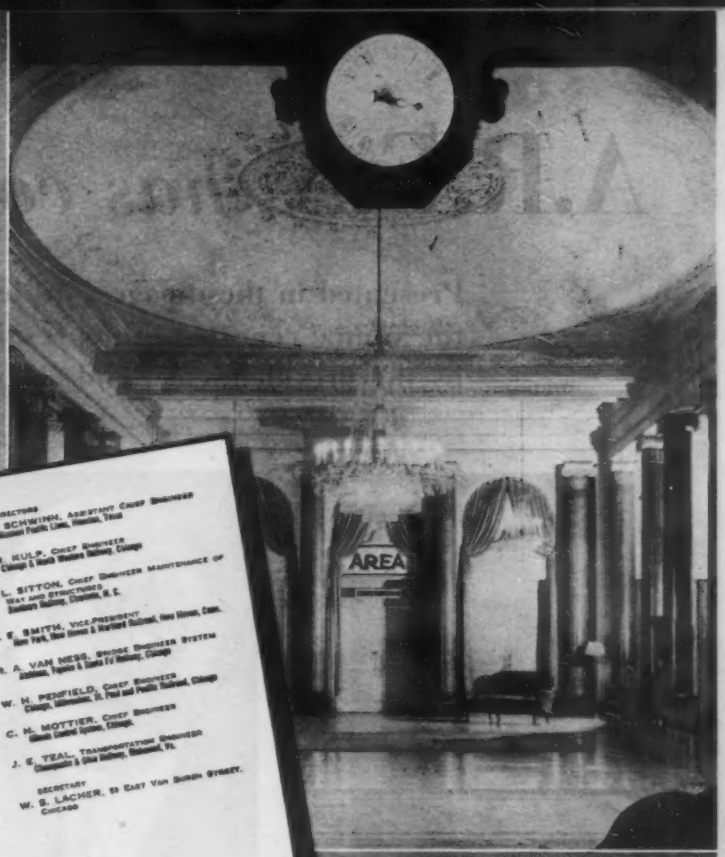

American Railway Engineering Association

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TELEPHONE WABASH 7000

January 24, 1945

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SECRETARY
W. S. LACHER, 59 East Van Buren Street, Chicago

Mr. N. D. Howard, Engineering Editor,
RAILWAY AGE
105 West Adams Street
Chicago 3, Illinois

Dear Mr. Howard:

Your plan for publishing an A.R.E.A. Convention and N.R.A.A. Exhibit-in-Print Issue of the Railway Age to give recognition and publicity to the work of our Association in a year when war conditions make it inadvisable for us to hold our regular annual meeting meets with my unqualified approval.

The publishing of such an issue of Railway Age at this time is not unexpected, because for many years you and your associates have given the work of our Association much of your space, and at the same time the advice and help of your editors. Your continued co-operation at the present time when no annual meeting will be held is particularly valuable to our members and to other interested railway men, and is greatly appreciated by the officers and directors of our Association.

In your report many will be interested no doubt in the facts pointed out in my review of the activities of our Association during the past year, activities which, as in the past, have been dedicated to the advancement of knowledge pertaining to the scientific location, construction, operation and maintenance of the fixed properties of the railways. I commend their attention particularly to the technical reports of our standing and special committees, which again this year deal with specific and detailed problems of engineering and maintenance officers, especially those pertaining to and influenced by present war conditions.

It is particularly gratifying that your publication is again planning this year to direct attention to our reports, for only through the widest dissemination of the results of our committee work, can our Association be of the greatest value to the railroads and the country. Again assuring you of our appreciation of your interest in our behalf I am,

Sincerely yours,

F. R. Laying

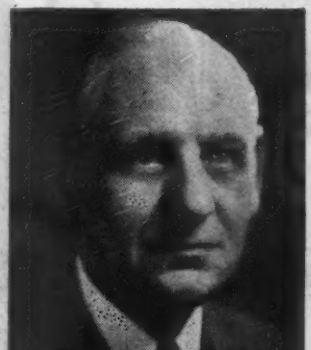
President

AMERICAN RAILWAY ENGINEERING ASSOCIATION
1945
NATIONAL RAILWAY APPLIANCES ASSN.

N.R.A.A.
exhibit in print

A.R.E.A. *has convention in print*

Presented in these pages, in lieu of the regular meeting, are the annual reports of the president and secretary, a statement by the president-elect and abstracts of all committee reports



Frank R. Layng
President

A. A. Miller
President-Elect

President's Report Is Record of Valuable Services Rendered

By FRANK R. LAYNG*

THE American Railway Engineering Association is built around its committees, and the work of these committees is brought to a conclusion each year when they present their reports at the association's annual meetings. Because of conditions imposed by the war, it has been necessary for us to forego our convention this year, thus denying our committees the opportunity to present their reports in person and to receive oral comments thereon. For the same reason, your president cannot appear before you for the purpose of submitting an account of his stewardship as your executive officer during the last year, and to offer his interpretation of the trend of association affairs during that time. As a consequence, it is necessary for me to substitute this written statement in which I shall summarize the work done and attempt to give you a brief account of the action taken by your Board of Direction in its efforts to promote the effectiveness and usefulness of your association.

Nature of Service Rendered

Considered in the aggregate, only a relatively small portion of the duties of the railway engineer is concerned with problems of an emergency nature. True, he plays an important part in times of flood and other disasters, but, on the whole, the value of what he accomplishes is measured through the years to come rather than in the immediate present. For the same reason, the service rendered by your association in the war effort has been essentially different in character from that performed so efficiently by the various other divisions and sections of the Association of American Railroads, with which the American Railway Engineering Association is so closely identified.

During the last three years, the several emergency committees organized to represent you have been called upon at various times to act promptly in matters requiring immediate action —usually relating to problems arising out of the shortage of materials used in railway tracks and structures. The allotting of rail and the need for simplified practice in rail sections and in tie plate design are illustrative of the kinds of problems that have been presented.

However, the most important service which your association has rendered to the railroads, the construction industry and the armed forces, is to be found in the availability of its recommended practices—practices that are both authoritative and encyclopedic in scope in their relation to the fixed properties of the railways. The fact that these specifications and practices which we recommend have been adopted as *standard* in much of railway construction for war purposes is a source of satisfaction to all of us.

The usefulness of the American Railway Engineering Association during this period of intense activity is indicated by the augmented demand that has prevailed for its publications, especially the Manual, and, in the case of the railroads, by an increase in the number of applications for membership. This is conclusive evidence of a realization on the part of both managements and men that railway engineers profit from participation in the work of the association, as well as from reading its publications.

Widespread Use of Publications

Because of the high regard with which our publications are held, and because of the extensive use made of them, it has seemed to your Board of Direction that our primary function during the war, as in times of peace, is to insure the thorough reliability and practicability of our recommended practices and specifications under all circumstances. In a few cases it was found necessary to introduce emergency specifications for the purpose of meeting critical situations arising out of shortages of particular materials. However, in many other cases it has been necessary to apply the reputation of your association and the good offices of those representing it in demonstrating that strict adherence to specifications is a vital requisite in a program that will insure the continued effectiveness of the railroads as the primary agency of war transportation.

On the whole, therefore, the com-

* President, American Railway Engineering Association. Chief Engineer, Bessemer & Lake Erie.

mittees of the American Railway Engineering Association have been engaged, as heretofore, in the study of problems growing out of day-to-day experiences with the properties of our railroads. However, as many of these problems are the result of conditions brought about by the wear and tear of war traffic and the expeditious handling of this traffic, the committees are, after all, engaged in matters that have a distinct bearing on the war effort.

Reports Are Larger

In the main, the problems that are demanding the attention of the committees are but aggravations of situations that confronted them before the advent of the heavy war traffic, and so far as most of the committees are concerned there has been more for them to do than ever before. Unfortunately, most of the members have been unable to devote as much time to committee work as heretofore, either in their own studies of the problems or in discussions of them at meetings. Fewer meetings have been held and, with rare exceptions, the attendance has been smaller than in previous years. These circumstances are reflected in those portions of the committee reports which represent the work of the individual members. They are both shorter and fewer in number.

While, therefore, the reports prepared by committee members have been curtailed, actually the total volume of the reports is larger, to the extent of 280 pages of text matter in the bulletins, than in 1944, because of the marked increase in the size of the reports on research work. The decline in the activity of the committees is, without doubt, a temporary condition which can be ascribed to the enormous burden imposed on all railway men by measures adopted by the carriers in their efforts to handle the heavy war traffic. While this condition prevails, I am sure that we all look forward to a continuation of the intensive work being done by the research staff of the Engineering division and the engineering materials staff of the University of Illinois, not only in conducting field investigations and laboratory studies but also in preparing reports thereon. As soon as the emergency is over, intensive committee work will, without doubt, be resumed.

Walter S. Lacher
Secretary

Research Work

The plan of co-operation between the Association of American Railroads and our committees in the conduct of research work is essentially unique. The actual testing and laboratory investigations are made by men especially qualified and trained to deal with scientific measurements. On the other hand, we are assured that these tests will parallel practical conditions of service by an arrangement through which our committees provide a liaison between the scientific worker and the practical railroad man. The merits of this plan have been thoroughly demonstrated and I am sure we will want to continue it.

The work of our research organization has borne fruit in the publication of an enormous volume of valuable information, and I wish to direct your attention in particular to the final report on Impact in Short Span Bridges, published in Bulletin 450, for January, 1945, and to the reports of the committees on Rail and Track, which appear in Bulletin 451, for February. Still another report of outstanding significance is that on the Counterbalance Tests of Locomotives for High-Speed Service, which was published in Bulletin 447 for September-October 1944.

The investigation described in Bulletin 447 was carried out under auspices entirely independent of the American Railway Engineering Association, namely, the Joint Committee on Relation Between Track and Equipment, in which both the Engineering and Mechanical divisions of the Association of American Railroads are represented. However, the tests reported, representing the expenditure of large sums of money over a period of four years, and embracing a far more comprehensive study of the subject of counterbalance than had ever been attempted before, were deemed of such interest and value to our membership that your secretary was authorized to have them printed as an American Railway Engineering Association publication.

A. A. R. Appropriations

Before dismissing the subject of research, I cannot refrain from an expression of appreciation of the co-operation which the American Railway Engineering Association has received from the Association of American Railroads in the form of increasing appropriations for the investigations that have been undertaken at our suggestion. Surely, this is evidence of the confidence that has been placed in us—confidence that the projects we propose are based on sound premises, that we will provide wise counsel, and that rational conclusions will be reached. I feel that we may be pardoned for pointing with pride to the results of these investigations, to

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Secretary

W. S. Lacher, 59 East Van Buren Street, Chicago.

Assistant Secretary

Frank McNellis, 59 East Van Buren Street, Chicago.

mention only one, the discovery during the last year of the cause of horizontal cracks in rail webs, which have been the occasion of no little anxiety and of some unwarranted criticism of the 112-lb. RE rail section.

Research Administration

We have been able to effect a reorganization of the administration of the Engineering, Division research, which not only expedites procedures, but which also enables our research engineer, G. M. Magee, to avail himself of the advice and counsel of a committee of chief engineers, with headquarters in Chicago. This committee, composed of W. H. Penfield of the Milwaukee (chairman), H. R. Clarke of the Burlington, and B. R. Kulp of the North Western, is answerable to the General committee of the Engineering division, but relieves the latter of details that would consume endless time under the procedure of circular letters and letter ballots.

The reorganization of the administration of the Engineering division's research work was completed by action taken at the meeting of the Board of Direction on December 6 last, in disbanding the American Railway Engineering Association Committee on Research Administration. This committee, which consisted in part of members of the Board and in part of members of the former Special Committee on Stresses in Railroad Track, was, in effect, an interim committee created in 1941, when the resignation of the late Dr. A. N. Talbot resulted in the disbanding of the Special Committee on Stresses in Railroad Track, of which he had been chairman for 23 years. At that time it was not certain in what direction the investigations which Dr. Talbot had been carrying on would be continued, and it was deemed necessary to create a new committee to assist in the transfer of the activities to the Engineering Division research staff under the supervision of Mr. Magee, who was then in his fifth year as research engineer. With the appointment of the new Research committee of the Engineering division, the continuation of the American Railway Engineering Association research committee was deemed an unnecessary duplication.

It is with no little regret that we have noted the retirement, on September 1, 1944, of Professor H. F. Moore, who, as research professor of engineering materials at the University of Illinois, directed the cooperative investigation of the causes of the transverse fissure. We are indebted to Professor Moore for the contribution he made to the successful solution of this important project.

Policies and Procedures

Within a few years your association can point with pride to a half century of valuable service to the American railroads. Through these many years of active cooperation of railway engineers in the advancement of practice in location, construction, design, maintenance and efficient operation, there has been developed a pattern of procedure which has worked very well and which has been responsible for outstanding accomplishments. However, we must bear in mind that no established rules of procedure can continue unchanged in a changing world. Your Board of Direction is well aware of this, while realizing on the other hand that we must not cast aside practices that have stood the test of time without weighing carefully the circumstances that point to the need of change.

Committee Strength

As evidence of the fact that the Board is willing to entertain suggestions for revisions of its organization, procedures and policies, I direct attention to the fact that during the last two years two special committees of the Board have given generously of their time to some pertinent proposals offered by members who have the interests of the association very much at heart. To date no marked changes have been made, although I am sure there is an increasing awareness among the members of the Board of the necessity for being constantly on the alert to search out means for insuring the continued usefulness of the association under constantly changing conditions.

It has long been recognized that the value of our association is founded largely, if not entirely, on the strength and industry of its committees. Therefore, your Board of Direction has centered its attention on means of insuring a continuation of the high caliber of the personnel of the committees. As a result of the work of the Committee on Cooperative Relations with Universities, we have all become more or less conscious of the responsibility of our association to stress the importance of building up the personnel of the railroads through the recruiting of young men of high caliber. What we have in mind in particular is the selection of graduates of universities of high standing.

More Younger Men

The reason for this is the growing realization that the personnel of railway engineering departments at the present time includes very few young men, a state of affairs which cannot be dismissed as something brought about by the Selective Service Act. The real explanation is to be found in the fact that the reduction in engineering department personnel with the advent of the depression of the "thirties" virtually precluded the employment of young men. The general effect of this condition has been apparent for some time, but it was not until recently that attention was directed to the influence it has had on the personnel of American Railway Engineering Association committees. The Board Committee on Personnel is taking steps to recruit younger men so that they may be trained to take over leadership in our committee work while it is still possible for them to benefit from the guidance of the many older members who will be retired within a few years.

Committees Disbanded

During the last year the Board of Direction has authorized the disbanding of three committees, effective with the close of the association year in March, 1945. These are the committees on Signals and Interlocking, Electricity and Standardization. So far as the first two are concerned, it was our conclusion that the function which they have performed in recent years, namely, that of reporting the activities of the Signal and Electrical sections respectively, of the Engineering division, can be handled more simply and just as effectively through a co-operative arrangement with the two sections. Henceforth, instead of receiving reports prepared by these two committees, we hope to have the benefit of papers or addresses by representatives of the respective sections of the Association of American Railroads in these two specialized fields.

It was the conclusion that the duties of the Committee on Standardization could be taken over by the Board of Direction or by special committees of the Board, appointed as and when such action is necessary. In this connection I wish to point out that the decision to dispense with these three committees was taken only after consultation with the members of the committees, nearly all of whom concurred heartily in the proposal.

A. R. E. A. News

As president of the association, I have derived considerable satisfaction from the fact that it was during my administration your association launched the publication of the monthly leaflet which we have designated the "A. R. E. A. News." Responsibility for the initiation of this new publication must be credited to the late Elmer T. Howson, who, as chairman of the Board's Publication committee, pointed to the advantages of such a publication and urged that it be authorized. Starting at a time when printing is being conducted under the disadvantages of curtailed personnel and discouraging mail delays, the A. R. E. A. News has suffered serious handicaps. Nevertheless, I am sure it will prove of increasing interest and value to our membership.

In closing, I wish to express my appreciation of the work done by the men on our several committees, and particularly to express my indebtedness to Secretary W. S. Lacher and his staff, who have been of invaluable assistance to me in carrying on the work of the association during the past year. It has been a privilege for me to work with them.

Secretary's Accounting Reveals Year of Contrasts

*By W. S. LACHER**

THE association year ending March 14, 1945, presented a number of striking contrasts. It embraced an annual meeting in March, 1944, but was followed and preceded by years in which no conventions were held. It was marked by substantial increases in both revenues and expenditures, by appreciable additions to the membership and by a marked increase in the number of pages of printed matter in both the bulletins and proceedings. There was a substantial demand for the association's publications, especially for the Manual and its separate chapters.

Drop in Committee Attendance

On the other hand, the members were forced by war conditions to curtail their participation in the association's work. Lack of opportunity to leave their posts of duty and difficulty in obtaining travel and hotel accommodations compelled many of the members to forego attendance at committee meetings, the number of which was reduced to a minimum. In fact, several of the committees completed their reports for the year without holding any meetings at all. On the other hand, the annual meeting of the association held on March 14, 15 and 16, 1944, was well attended and, in many ways, was one of the most successful in the history of the association.

To sum up the conventional record as presented under appropriate headings in greater detail in the following statement, the accounts of the association show an increase of revenues over disbursements of $4,914.48; there was an increase of 42 in the number of members, bringing the total to 2,004; the committees submitted a total of 753 pages of report material for publication, compared with 473 pages in 1943, and Vol. 45 of the proceedings published in 1944 contained 774 pages, or 42 pages more than Vol. 44.

Membership

The membership record for the period February 15, 1944, to February 15, 1945, was as follows:

Members on rolls as of February 15, 1944		1,962
New members		128
Reinstatements		12
		2102
Lost by death	43	
Resigned	22	
Dropped	29	
Transferred from Junior to Full Member	4	
		2,004
Net gain	42	
Membership as of February 15, 1945		2,004

The composition of the membership as of February 15, 1945, compared with that on corresponding dates in the three previous years was as follows:

	1942	1943	1944	1945
Life	168	182	182	197
Member	1,466	1,496	1,485	1,515
Associate	272	249	257	259
Junior	37	38	38	33
	1,943	1,965	1,962	2,004

Finances

The financial statement for the calendar year 1944 may be summarized as follows:

Receipts	$31,496.83*
Disbursements	26,582.35
Excess of receipts over disbursements	$ 4,914.48

* Includes credit of $956.25 from the sale of bonds.

The number of text pages in the seven bulletins ending with Bulletin 451, February, 1945, was 1,305, or 574 pages more than in the seven bulletins ending with the issue of February 1944. The difference is explained by the publication during the last association year of three bulletins of more than 300 pages each, including Bulletin 451, which is the largest issue published since March, 1929.

Further progress was made during the year in the revision of the Manual, the record showing that 131 new sheets were issued in 1944 and that 109 were withdrawn, producing a net increase of 22. The high level of the demand for the Manuals continues to an extent that is constantly exceeding estimates, and which, as a result, is disrupting schedules for the reprinting of the Manual. The number of Manuals sold in 1944 was 206, an increase of 20 per cent over the sales in 1943.

It had been assumed that the sharp rise in the demand for copies of the Manual which followed the advent of the war effort would subside as projects for munitions plants, army camps, naval bases and other construction induced by the war would be completed. However, activity in this field has continued much longer than had been anticipated, and there is now reason to believe that the demand for the Manual will continue at a high level with the inception of projects for the reconstruction of railroads in devastated areas.

The elimination of certain committees of the association has led to the suggested consolidation of several chapters in the Manual and, as the result of recommendations coming from three of the committees, the Board has approved the following changes:

Chapter 21—Economics of Railway Operation, will be consolidated with Chapter 16—Economics of Railway Location.

The contents of Chapter 23—Shops and Locomotive Terminals, will be divided between Chapter 6—Buildings, and Chapter 14—Yards and Terminals.

The number of committees, 25, has remained as it was a year ago. However, effective with the close of the association year on March 14, 1945, as the result of a resolution of the Board of Direction on December 6, 1944, three committees will be dispensed with, namely, the committees on Signals and Interlocking, Electricity, and Standardization. The reason for taking this action is set forth in the report of President Layng on preceding pages. Thus, there will be 22 committees, of which 20 will be regular (numbered) committees and 2 special committees.

Thirty meetings were held during the last year compared with 26 in the calendar year 1943. Reports were prepared by 22 of the 25 committees, there being no occasion for reports from the committees on Standardization, Uniform General Contract Forms and Iron and Steel Structures.

An analysis of the output of committee reports, measured in terms of the number of pages of material printed, brings out a rather remarkable contradiction. The total number of pages of committee reports prepared for consideration at the annual meeting which was to be held this year totals 753, compared with 473 pages in 1944, or an increase of 280 pages. However, it is interesting to observe that of the 753 pages presented this year, 484 pages embrace reports on research work carried on by members of the Engineering Division research staff or by the staff at the Materials Research Laboratory, University of Illinois, leaving only 269 pages of report material that originated with the members of the committees. These figures compare with 140 pages of material in the committee reports for the association year ending with March 1944 that comprised data on research studies, leaving 333 pages that were prepared by the members of committees.

Research work of the Engineering division financed by the A. A. R. was continued on an expanded scale and, as in previous years, a large part of it was related to the subject assignments of A. R. E. A. committees. The accompanying tabulation shows the amounts

Some of the Outstanding Reports Among the 68 Presented to the Association

Locomotive Counterbalance
Impact on Bridges
Rail Design
Investigation of Shelly Rail Coordinated Highway Service and Its Effect on the Economics of Railway Operation
Federal Regulation of Drinking Water Supplies
Mechanics of Foaming and Carry-Over in Locomotive Boilers
High-Speed Watering Facilities for Streamline Trains
Engine Laundries and Blow-Off Pits at Engine Terminals
Shop Facilities for Diesel Locomotives
Fire Retardant Coatings for Wood Structures
Conserving Labor and Materials in Building Maintenance and Construction
Organization, Methods and Equipment for the Maintenance of Terminal Facilities
Cooperative Relations with Universities
Tests of Glued, Laminated Stringers
Design of Concrete Mixers
Recent Grading Practices
Stabilization of Roadbed

* Secretary, American Railway Engineering Association, Chicago.

allotted to various committees or projects during the last two years, as well as the budget allotments for these projects for 1945, which total $138,110, or $29,452 more than in 1944.

Engineering Division Allotments for Research

	1943 Budget	1944 Budget	1945 Budget
Committee on Rail...	$31,052	$36,480	$44,918
Committee on Track .	6,000	16,000	25,000
Relation Between Track and Equipment ..	30,000	25,000	25,000
Structural Projects...	19,300	20,200	21,000
Miscellaneous Projects	12,190	11,370	22,192
Grand Total	$98,542	$109,050	$138,110

Included in the appropriations for research in recent years have been the allotments for the work carried on under the auspices of the Joint Committee on Relation Between Track and Equipment, which completed the major portion of one of its primary assignments during the last year. This is the investigation of the counterbalancing of locomotives, on which work was in progress for four years, and which resulted in the publication of two noteworthy reports. These two reports, embracing a total of 444 pages and including nearly 300 charts and drawings, provide a fund of valuable information for those concerned with the effect of locomotive counterbalancing on railway track.

Other research projects conducted during the year by the Engineering division, alone or jointly with other agencies, include the following:

Committee on Rail—Rail failure investigations; transverse fissure investigation; service tests of joint bars; rolling-load tests of joint bars; investigation of shelly spots and head checks; investigation of engine burns; and rail design investigation.

Committee on Track—Investigation of stresses in tie plates; bolt tension tests; corrosion from brine drippings; welding of manganese frogs; stresses in manganese frogs; and rail anchorage.

Relation Between Track and Equipment—Rail gage and wheel contour; relation, wheel load—wheel diameter; and flat spot investigation.

Structural Projects—Impact investigations and fatigue strength of structural welds.

Miscellaneous Projects—Electrolysis study; roadbed stabilization; and boiler feedwater study.

Special mention may well be made of the report of the Committee on Rail, included in Bulletin 451, as affording evidence of the amount of work being carried on by the group employed under the direction of the research engineer and his staff in the Talbot Laboratory at the University of Illinois.

Attention is directed to the fact that the foregoing research projects, all of which will be carried forward in 1945, include a new item introduced upon the recommendation of the Committee on Roadway and Ballast, namely, roadbed stabilization. For the immediate future, the work under this heading will be confined to a study of the introduction of cement grout into the subgrade, but it is possible that the scope of the research in this field may be expanded eventually to include other special applications of soil mechanics to problems of railway roadbed.

President-Elect Urges Members to Higher Achievement

By A. A. MILLER*

WITH World War II—and may it be the last armed conflict between nations—at its height, we are experiencing, and for more than two years have been experiencing, more or less violent disturbances of our normal routine, our thinking, our procedures and our relations with men and things. Fortunately, the intuition that is nurtured in our democracy, the hope and faith which constantly are leavening our America and keeping us on the march to better things and the understandings which guide us, enlighten us and give us the inspiration to carry on and to strengthen the institutions that we have built in America, and are offering to the World.

The American Railway Engineering Association, like many other associations and societies, has been disturbed in some of its processes and procedures, but only to the extent that some ways and means to desired or designed ends have temporarily been changed. Our intent and purpose have not changed. Our efforts are growing stronger under the adversity of a passing emergency.

In the turmoil and upheaval resulting from world events, the American Railway Engineering Association carries on. While we cannot foresee the events of the coming year, and, therefore, cannot know what may be in store, we can all hope and pray that peace will not be long delayed, so that we may again patiently and inspiringly labor under less disturbing experiences and circumstances.

There has probably never been a time in the history of the world when the need for "thinkers" and "doers" has been more urgent than the time in which we live and carry on. There is probably not a more democratic and purposeful institution than the American Railway Engineering Association. Our constitution clearly sets forth our purposes, and in no sense is it limiting. On the contrary, it functions best when expanded most. We hold fast to the proved good coming out of our past labors, hopefully visualize the uncovering of more and greater truths in the future than we can make use of. This calls for effort, concentration, determination, vision, hope, faith, and a great measure of inspiration.

In the possibly troublesome times ahead—and no man knows how long a time—it, is my hope and prayer that we, the membership of the American Railway Engineering Association, individually, think on these things, and collectively grow ever stronger in our purposes, knowing that there is no excellence without great labor; that there is no satisfying accomplishment for good without vision, hope and faith.

I ask those who know most of the traditions, the history, the purposes, the accomplishments, and the contributions for good of the American Railway Engineering Association, to enlighten others, for the substance of things past and hoped for is a leaven at work in the A. R. E. A. for the good of all.

I am asking also that the different committees work with vision and inspiration; that the membership give the benefits of their analyzing and thinking to the committees; that all help on the way to better things and higher planes of accomplishment. Working thus, we will be blessed—all of us.

* President-elect, American Railway Engineering Association.
Chief Engineer Maintenance of Way and Structures, Missouri Pacific Lines.

Election of Officers

In the election of officers of the association, which was conducted by letter ballot during January and February, the following officers were elected to serve for the ensuing year: President, A. A. Miller, chief engineer maintenance of way and structures, Missouri Pacific, St. Louis, Mo.; vice-president, to serve two years, C. J. Geyer, general manager, Chesapeake & Ohio, Richmond, Va.; directors, F. E. Bates, chief engineer, Missouri Pacific, St. Louis, Mo.; G. A. Haggander, assistant chief engineer, Burlington Lines, Chicago; and R. E. Dougherty, vice-president, New York Central, New York; members of Nominating committee, J. S. McBride, chief engineer, Chicago & Eastern Illinois, Chicago; A. B. Stone, assistant chief engineer, Norfolk & Western, Roanoke, Va.; H. F. King, special engineer, Erie, Cleveland, Ohio; R. J. Gammie, chief engineer, Texas & Pacific, Dallas, Tex.; and Edward Wise, Jr., engineer maintenance of way, Louisville & Nashville, Louisville, Ky.

In addition, J. B. Akers, assistant chief engineer, Southern, Washington, D. C., and vice-president of the association, was advanced automatically to senior vice-president, succeeding Mr. Miller.

Installation of these officers took place at a meeting of the Board of Direction in Chicago on March 14, when the Board met to review the activities of the association and to put under way plans for the year ahead. A feature of this meeting was a luncheon tendered to the Board, at the Palmer House, by the National Railway Appliances Association.

A. R. E. A. Technical Committee Reports

Abstracts of the technical reports of 21 committees of the association, including material recommended for adoption, as well as that submitted only as information

TO replace the usual presentation of the reports of its technical committees before its annual meeting, which is not being held this year because of war conditions, the Board of Direction of the American Railway Engineering Association adopted an emergency procedure, formulated in 1943, when no annual meeting was held, for reviewing the reports, while at the same time giving members an opportunity to express themselves concerning the reports and to pass on all material recommended for addition to or deletion from the Manual.

Letter Ballot

Under the procedure adopted, a special committee of the Board has reviewed all of the reports as submitted, together with such comments on or discussions of the reports as were received from members—the committee giving special attention to material recommended for adoption and publication in the Manual. As the result of this review, material recommended for the Manual, approved by the Board at a one-day meeting in Chicago on March 14, will be submitted to members of the association for letter-ballot approval or rejection, and subsequently, the reports, written discussions and results of the letter-ballot will be published in the Annual Proceedings for 1945. Revisions of and additions to the Manual (approved by letter-ballot by the members) will be issued as usual in the annual supplement to this volume.

Following are abstracts of all of the committee reports, including the recommendations of the different committees:

Roadway and Ballast

*F. W. HILLMAN, Chairman**

This committee presented reports on 8 of its 15 assignments, one of which was a final report and the others progress reports. All were presented as information.

Properties of Earth Materials—In its report dealing with the physical properties of earth materials, the committee states that to supplement the improvements in the design of track, research on the relation of moving loads to elasticity and deformation of the roadbed merit particular study, especially for the purpose of obtaining a more adequate track structure to meet the demands of higher speeds. Previously, the committee said, the means of improving the character of roadbed on existing lines has been limited largely to improved drainage.

The report adds that great strides have been made in recent years in the science of soil mechanics, whereby the deformation of soil under load may be decreased by control of the moisture content and other means of stabilizing the material. To the extent that these methods can be applied to stabilize existing roadbed without disturbing the track structure, the committee believes them to be of special interest as providing possibilities for better supported track with decreased maintenance costs.

Culverts—This report submits specifications for the bituminous coating of galvanized culverts, corrugated metal pipe for subdrains, corrugated structural plate pipe and arches, and the paving of corrugated metal pipe for use in culverts, underdrains and sewers. The specifications are submitted this year as information, to solicit comments and criticisms, before being offered for approval and publication in the Manual. These specifications cover materials and manufacture, and sampling and tests.

Formation of Roadway—Under the subject, dealing with recent grading projects, the committee submitted a final report, presented as information, which includes facts on nine additional new-line projects completed in 1943 and 1944, all of which involved considerable grading. As in previous reports covering 14 other projects, the report consists of a series of tables giving general data on the projects; the principal types of grading equipment used; the manner in which the material was compacted and the resulting settlement; the manner in which the foundations of fills were prepared; and the preparation of the sub-grade. Some additional information is also presented on the behavior of fills on seven of the projects reported on previously. The committee is satisfied that the importance of well built embankments is now generally recognized, particularly where heavy traffic or high speed is anticipated, but points out that further improvements lie in the direction of the more careful selection of material or a more thorough consideration of the characteristics of the material in deciding on proper widths and slopes of both fills and cuts.

Roadway Drainage—Reporting on its assignment as to the extent to which recommended practices of the association relative to roadway drainage are being followed by the railroads, the committee states that there is a realization of the importance of surface and subsurface drainage; that there is an increase in the use of off-track equipment for drainage purposes; and that recommended practices are being followed, with such modifications as necessary to meet local conditions. Brief comments are included in the report to the effect that the use of grout to cure soft spots is becoming more general; that a sub-ballast of cinders, fine gravel or other suitable material is being widely used for new construction; and that the causes of soft spots resulting from faulty construction are generally recognized by present-day grading specifications.

Roadway Protection—Under its assignment, the committee submitted a progress report on stabilization of the roadbed by grouting methods, which it presented as information. This report states that up to November, 1944, 21 railroads have pressure-grouted track in 19 states and 1 Canadian province, and refers to the largest track grouting project yet undertaken, on the Atchison, Topeka & Santa Fe in eastern Kansas.† The report also states that most roads are using pneumatic grouting equipment, but that hydraulic equipment for track grouting has been greatly improved during the last year.

Two Viewpoints

The committee points out that there are two viewpoints on the proper composition of the grout: (1) a very lean mixture, necessitating the use of a very fine blow sand, with just enough cement to produce fluidity for pumping, and (2) a mixture rich enough to harden into a fairly solid mass. The objectives of the two methods are the same, however—to drive out water and fill the voids with grout. The report adds that in every case where grout has been applied, track performance has been improved, long-standing slow orders have been lifted, and a reduction in maintenance costs from 30 to 95 per cent have been reported.

Plans for Telltales—The committee presented, as information, tentative plans and specifications for one and two-track overhead and side warning telltales of wood construction. It does not recommend wood construction for the overhead portion of three- and four-track telltales, because the distance between vertical poles requires a span of such length as to result in an impractical wood design.

Out-of-Face Surfacing—Reporting on its assignment to study the use of ballast for out-of-face surfacing to determine the proper type and height of lift, the committee states that for excellence in results the minimum lift should be at least two inches, or an amount equal to at least ½ in. (preferably 1 in.) more than the maximum size of the ballast. The committee also

* Assistant Engineer Maintenance, Chicago & North Western.

† Reported in the January 13 *Railway Age*, page 142.

recommends that since the lift is frequently made with the material in the cribs, unless it is too foul and dirty, and since this material is also used for spot surfacing, the maximum size of ballast used for filling cribs and dressing, after out-of-face surfacing, should be kept to a minimum. For this purpose, ballast not more than 1½ in., and preferably 1 in., in size is recommended.

Asphalt in Ballast—A progress report, offered as information, was submitted by the committee on its assignment to investigate the use of asphalt in ballast. This report tells of minor repairs to a 600-ft. test section of asphalt-coated stone ballast on the New York Central at Bryan, Ohio, installed in 1939. The committee says that the test section has remained in good line and surface and rides well, and that, to date, it has given satisfactory results.

Buildings

A. B. STONE, Chairman*

Reports were presented by this committee on four of its six assignments, including three progress reports and one final report, presented as information.

Specifications for Railway Buildings—The report on specifications for railway buildings calls attention to the fact that the W. P. B. National Emergency Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings were revoked on October 4, 1944, and consequently, that page E-6-1 of the Manual becomes void.

Design of Shop Facilities for Diesel Locomotives—In this report, which supplements a report presented in 1943, the committee discusses the three fundamental types of Diesel shops as, first, a type for carrying out regular inspection and routine running maintenance, which includes I.C.C. monthly and annual inspections and routine replacements and repairs due to use, wear or failures in service operations; a second type that is designed for heavy maintenance and general repair operations; and a third type that is, in effect, a combination of the two already mentioned. In each case the report describes the desirable features to be incorporated in the shops, giving particular emphasis to pits, floor levels, auxiliary shop areas and servicing facilities.

The report also discusses the possibilities of adapting existing available shop facilities to Diesel maintenance, but points out that where this is to be done in the future, experience indicates, in the interest of cleanliness—an essential in Diesel maintenance shops—and the greatest efficiency of mechanical operations, certain fundamental features be incorporated in the adapted facilities, some of which are similar to those desirable in new Diesel shop layouts.

Fire-Retardant Coatings—Following through on its assignment to investigate fire-resistant wood for railway buildings, the committee studying this subject points out that the protection of wood can be achieved by impregnation with fire-retarding chemicals and by the application of surface coatings having a fire-retarding effect. A report on the former method was submitted as information in 1944, so the committee confined its present report, also presented as information, to the subject of fire-retardant surface coatings.

Two Classifications

In its discussion of such coatings, the committee classifies them in two general groups, for interior or exterior protection. Formulas are given for paints used for interior protection, including borax-linseed oil paints; water solutions of sodium silicate with pigments; alginate preparations, with and without borax; boric acid; and whitewash. Casein paints, including borax, are also mentioned, but the committee adds that the fire retardant properties provided by three coats of whitewash or casein paints are by no means comparable with those afforded by three coats of borax-linseed oil paint, sodium silicate, or the phosphate-alginate preparations.

For exterior use, two fire-retardant coatings are discussed in some detail. One of these is a linseed oil paint containing approximately 60 per cent pigment and a large proportion of volatile and thinner, which dries to an elastic film of extremely high pigment volume with a low percentage of organic binder. The formula of a paint incorporating zinc borate is also given and the effect of zinc borate in reducing flame spread is pointed out.

Continuing, the committee report explains various flame-spread and flame-penetration tests, and then presents a series of tables showing the results of fire-tube tests on untreated Southern yellow pine of varying density, and on various other species of untreated woods, as well as on specimens of Southern yellow pine with various fire-retardant coatings. Tables are also presented of tests of fire-retardant coatings applied to resin-bonded plywood and to plywood panels bonded with soybean glue, and of assembled wall panels of plywood containing various thicknesses of insulation.

Conserving Labor and Materials—In preparing its report on means of conserving labor and materials, including the adaptation of substitute non-critical materials and specifications for the reclamation of released materials, tools and equipment, which report was presented as information, the committee collaborated with Committee 3A—General Reclamation, of the Purchases and Stores division, A. A. R. In this report, the committee emphasizes the fact that the picture with regard to both materials and labor is changing constantly. It suggests that, because of the great need for conserving labor, and because of a lack of skilled men in many cases, simplified designs and details of construction be adopted that are easy to understand and that call for the use of fewer tools. It also suggests that finished classes of work, such as window and door frames, can be ordered complete with locks, hinges, etc., thereby insuring better results at lower cost.

Specific recommendations made for the conservation of materials include the construction of rubble stone foundations or retaining walls, where skilled stone masons are available; the use of salvaged brick on concrete footings for fundation construction; the use of demountable unit forms for concrete work, of such design as to permit their repeated use; the use of brick, stone, concrete blocks, hollow concrete blocks or hollow clay tile for outside walls; the use of asbestos-cement or corrugated asbestos siding; concrete for floors; brick, hollow tile, gypsum tile, concrete blocks and structural blocks for inside partitions; and glass blocks for window areas.

* Assistant Chief Engineer, Norfolk & Western.

Track

I. H. SCHRAM, Chairman*

This committee submitted reports on 8 of its 13 assignments, of which 7 were progress reports, presented as information. The other was presented for adoption.

Fastenings for Continuous Welded Rail—Under this assignment, the committee submitted a progress report, describing a new test it plans to install on the New York, New Haven & Hartford to determine the practical resistance to expansion and contraction of continuous rail offered by tie plates and spikes.

Track Tools—Reporting on this assignment, to study plans and specifications for track tools, including their repair and reclamation, with recommended minimum limits for reclaimed tools, the committee recommends that the plans for 14-lb. and 16-lb. double faced sledges be removed from plan No. 13-45, and submits a revised plan 20-45 for track gages to be substituted for plan No. 20.

Switches, Frogs, Crossings, Etc.—In a progress report on this subject, dealing with plans for switches, frogs, crossings and spring and slip switches, which was submitted as information, the committee refers to the installation of a number of No. 10 131-lb. RE rail-bound manganese steel frogs of a new design, and also to the work done on a research program, undertaken during the year, to investigate stresses in crossing frogs.

Welding Manganese Castings—Under this assignment, the committee presented additional detailed information on the investigations under way on the Chicago, Milwaukee, St. Paul & Pacific, and on the Toledo Terminal, and reviewed the second report of laboratory studies being carried out in connection with the Milwaukee tests.

The second report on the laboratory studies deals with the welding of high-manganese steel with different kinds of welding rods and with different amounts of welding current. It also covers tests made to determine the effect of welding on work-hardened surfaces and on flame-cut or arc-cut surfaces.

Based on the field and laboratory tests, the committee submitted, as information, the following series of tentative conclusions and comments on high-manganese steel welding: (a) It is important to remove

* Chief Engineer, Maintenance of Way, Erie.

cracks or defective metal by grinding before welding; (b) the most desirable welding current for a 3/16-in. bare rod is greater than 100 amp., and good results were secured with 125 and 150 amp. for the nickel-manganese and the copper-molybdenum-manganese rods, respectively; (c) in some of the tests, the performance of welds made with copper-molybdenum-manganese rods was somewhat superior to those made with nickel-manganese rods; (d) the removal of work-hardened surface by deep grinding before welding did not give noticeable benefit; (e) results from coated rods were indeterminate; (f) field tests on the value of peening were indeterminate, but laboratory tests show definite benefits; (g) welding on a flame-cut surface without removing the heat-affected metal to a depth of 1/8 in. or more by grinding is not recommended; and (h) good welds can be obtained in cold weather.

Bolt Tension—The committee reviewed the results of extensive tests in connection with its assignment to study the bolt tension necessary for the proper supporting of rail joints, and submitted the following conclusions:

(1) The purposes of providing tension in track bolts are: (a) to draw the joint bars into place and overcome the roughness of the fishing surfaces, thereby providing proper seating of the bars; (b) to hold the bars in place and produce an integral action of the bars of a joint in resisting bending in the vertical and horizontal planes; (c) to provide sufficient reserve tension to carry over the periods between tightenings; and (d) to provide the necessary support without unduly restricting longitudinal slippage of the rail ends.

Recommended Practices

(2) The following practices are recommended to accomplish these purposes: (a) The applied bolt tension should be 20,000 to 30,000 lb. per bolt for the initial tightening and 15,000 to 25,000 lb. for subsequent tightenings; (b) track bolts should be retightened one to three months after the joint bars are applied, and once a year thereafter; and (c) a corrosion-resistant lubricant applied to the bolt threads will reduce variations in thread friction and will promote uniformity of the bolt tension obtained.

Placing Anti-Creepers—In carrying out its assignment to make recommendations on the number and placing of anti-creepers required to meet various conditions, the committee submitted three exhibits dealing, respectively, with the anti-creeper test being conducted on the westbound track of the Chicago, Milwaukee, St. Paul & Pacific, near Mauston, Wis.; on the northbound track of the Illinois Central, near Kankakee, Ill.; and on a single-track main line of the Milwaukee near Burlington, Wis. All of these tests were established in 1943, using Improved Fair rail anchors, and each test, when installed, comprised nine one-mile stretches, each involving a different method of anchoring. In each test, initial measurements were made after the anchors were applied and the track work was completed, and subsequent measurements were made in 1944. The report contains numerous drawings and graphs showing the arrangements of anchorage used and also submits the measured data on the rail creepage, joint gap openings and tie movement.

Although the tests have not been in existence very long, the committee reports that several of the methods of anchoring in the Milwaukee tests have already been discarded as unsatisfactory, and that these have been modified. It also points out that comparisons between the other methods of anchoring are still more or less indeterminate, and must await the development of more evidence through a longer service period.

Stresses in Tie Plates—In a progress report, offered as information, the committee handling this assignment described a test of seven designs of tie plates for 112-lb. RE rail, made on both curved and tangent track on the southbound main track of the Illinois Central between Dyersburg, Tenn., and Memphis; another test of seven designs of 131-lb. tie plates on both curved and tangent track on a single-track main line of the Southern, near Chattanooga, Tenn.; and tests made of two designs of 112-lb. tie plates on both curved and tangent track on the Chicago, Burlington & Quincy, near Lathrop, Mo.

All of these tests were made for the purpose of determining the effect of the tie plate design on the stresses developed in the plates and in the rail; the extent to which the plates will bend under traffic; and the rate of mechanical wear produced by the plates on treated hardwood and softwood ties. The report states that the magnitude of some of the stresses measured are surprisingly high, being considerably above the elastic limit of the grade of steel used. No permanent set was observed in the plates, however. This is believed due to the fact that the elastic limit of the plates was raised by the cold working effect of traffic before the stress measurements were taken. The report adds that more extensive stress measurements will be taken in 1945 on the Illinois Central and Southern tests.

Conserving Labor and Materials—Reporting on its assignment to study means of conserving labor and materials, including the adaptation of substitute non-critical materials and specifications for the reclamation of released materials, tools and equipment, the committee called attention to the comprehensive monograph on Conservation and Reclamation of Material for Maintenance of Way, by R. P. Winton, welding engineer, Norfolk & Western, which was published in A. R. E. A. Bulletin 446, June-July, 1944.

Wood Bridges

R. P. HART, Chairman*

This committee presented reports on two of its seven assignments, including Revision of the Manual and a progress report on conserving labor and materials, presented as information. For adoption and publication in the Manual, it presented revised specifications for wood piles, largely to correct terminology and to add a number of species of wood to the tables on first-class piles.

Conserving Labor and Materials—In its progress report on means of conserving labor and materials and the reclamation of released materials, tools and equipment, the committee suggests that supervision must endeavor to increase the output of each man by instruction, simplified application, reduced lost motion, machine aid, or any other effective means. It recommends the use of highway trucks, where possible, for transporting both labor and materials to reduce lost time, and also the planning of work to accomplish it with the least detention of labor, and adds that the conservation of both labor and material require competent, detailed inspection of wood bridges and trestles in order that all available labor and material will be applied to best advantage. Concerning reclamation, the committee states that, in general, all released materials that are sound should be reclaimed and used.

Glued Laminated Beams

In an appendix to this report, on tests of creosoted, glued laminated stringers, it is indicated that glued laminated beams are as strong or stronger than sawed beams, creosoted or untreated; that there is no apparent effect of the creosote or treatment on the glue used; that there is little difference in strength between incised beams, treated or untreated; that shear strength seems to be about the same in laminated beams, incised or unincised, treated or untreated, and about 25 per cent or more greater than in sawed beams; and that glued laminated beams are stiffer than sawed beams.

Work Equipment

C. H. R. HOWE, Chairman*

This committee submitted a final report, presented as information, on self-contained, direct-blow gasoline tie tampers. No reports were offered on its other 11 assignments.

Unit Tampers—This report states that the battery ignition tie tamper unit has gained an outstanding place in track maintenance equipment and, generally speaking, is being used most extensively in spot-tamping, picking up joints and tamping newly installed ties. However, it points out that satisfactory work has been accomplished with these units in out-of-face surfacing, and that they work well in rock, gravel or cinder ballast when equipped with the proper tamper bar. The report describes the battery-type unit tamper in considerable detail and how the batteries are used and are cared for.

As regards the magneto-ignition tie tamper, the committee states that it did not have comparable service data on this type of tamper, but that it appears from the information available that this type unit

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* Cost Engineer, Chesapeake & Ohio.

needs some strengthening and improvements. It presented a general description of the magneto-ignition machine, but points out that it is quite certain that this type unit will not be available for the duration, although several of these machines are in process of development.

Rail

W. H. PENFIELD, Chairman*

Progress reports were presented by this committee on 7 of its 13 assignments, and appended to the report as a whole is the Eleventh Progress Report of the Joint Investigation of Failures in Railroad Rails in Service and Their Prevention.

Rail Failure Statistics—Following usual practice, this portion of the report includes several compilations of rail failure statistics, prepared by W. C. Barnes, engineer of tests of the committee. These statistics are presented this year in a radically new form, special emphasis being given to control-cooled rail, which is now predominantly purchased, and only such data are presented on rail in track, manufactured by all processes, as will provide a continuing record and afford the necessary data for comparison.

The report states that 43,866 fissure failures were reported in 1943, of which 36,071 were detected and 7,795 occurred in service. It is apparent, the report adds, that the heavy detection of fissures must be credited with preventing the number of service failures from being excessively high. Concerning the effect of the controlled cooling process, the committee adds that it was expected that this process would reduce or eliminate transverse fissures failures but that there was little hope that it would have much effect on other types of failures. It pointed out, however, that records of all types of failures in "other" process rails, as compared with those in control-cooled rails of like age, indicate that the controlled cooling process is also giving greater freedom from other types of failures as well.

Continuous Welding—In this report, the committee presented a tabulation summarizing data to date concerning the various installations of continuous welded rail and the failures that have occurred in such rail. It also presented a tabulation of additional service failures that have occurred in eight of the installations that were listed in its 1941 report.

Service Tests of Joint Bars—With reference to its assignment to make service tests of various types of joint bars, the committee presented a comprehensive annual report, as information, complete with tables and charts, covering the service performance to date of nine different types of 112-lb. joint bars that it has under observation on the Atchison, Topeka & Santa Fe, and 12 different types of joint bars under observation on the Pennsylvania. Concerning the results of these tests, the committee says that differences in the performance during the last year, as determined by test measurements, permit for the first time a comparative rating of service performance. Accordingly, it offered the following conclusions:

The performance of the joints used with end-hardened rails is outstandingly better than those used with unhardened rails; longer service life may be expected with 36-in. bars than with 24-in. bars; to date, there is no appreciable difference in the performance of controlled-bearing and full-bearing bars of the same design; the performance of headfree bars is as good or better than that of head-contact bars of comparable section; the relative performance of long-toe bars, compared with near symmetrical, or short-toe bars, is good but not considered superior; and in the Pennsylvania tests the performance of the relatively light weight section F-4 bar compares quite favorably with that of the much heavier B-19 and A. R. E. A. bars.

Joint Bar Failures—Under its assignment on this subject, the committee submitted a third progress report on the rolling-load tests of joint bars being conducted at the University of Illinois under the direction of N. J. Alleman, special research professor of engineering materials. The report is in the form of a monograph by Professor Alleman and states that, because of the limited number of joints tested, it is not possible to formulate definite conclusions, and that additional points should be tested. It points out, however, that the tests indicate that the distortion of fishing surfaces resulting from the hot sawing of rail ends reduces the fatigue life of the joint bars and that the hardness of the joint bars generally bears a consistent relation to fatigue life.

Shelly Spots and Head Checks—Reporting on its assignment to investigate the causes of shelly spots and head checks in rail surfaces for the purpose of developing measures for their prevention, the committee submitted a progress report, offered as information, in which it was noted that shelling is much more serious and widespread than first realized. It also noted that while a shelly condition may be visible, in many cases fractures occur before there is any evidence of shelling on the surface of the head. Although the study of the assignment has not advanced far enough to warrant definite conclusions, the committee offers a series of comments on various phases of its investigation.

Research Assignment

Appended to the report is a statement prepared by G. M. Magee on that part of the assignment study carried out by the research staff of the Engineering division. This discusses the studies of rail and wheel contours, and states that the development of shelling in the gage corner of the rail is believed to be due to, or is related to, internal stress produced under wheel loads beyond the fatigue strength of the steel. On this premise, it points out that it may be expected that some advantage in preventing rail shelling may be obtained by lowering the top of the rail contour somewhat at the gage corner to correspond more nearly with the contour to which the rail becomes worn in service. Sectional drawings of rail heads are presented showing the 131-lb. RE contour, the N. & W. Special 1942 contour (laid in test track on the Norfolk & Western in June, 1942), and a proposed section of which 1,000 tons were rolled and laid experimentally in track on the Norfolk & Western in 1944.

Laboratory Studies

Also appended to the report is a third progress report of the shelly rail studies at the University of Illinois. This part of the report, in the form of a monograph by R. E. Cramer, special research associate professor of engineering materials of the university, reviews the laboratory studies made on this subject, which include a report on special rolling-load tests to produce shelling. The tests made this year include a check on 3-per cent chromium rail, on 0.45-per cent silicon rail, on mill heat-treated rail and on a laboratory heat-treated intermediate manganese rail. A graph of the change in profile of all 29 specimens tested to date is also presented, and the report states that the 3-per cent chromium rail appears to be outstandingly good, and that some heat-treated specimens have also shown very little flow.

Rail Design—An extensive progress report, presented as information, was submitted by the committee on the assignment to investigate recent developments affecting rail design. As outlined by the committee, the procedure of investigation has been set up in three parts—(1) to obtain field measurements and to analyze them to determine the range and frequency of stresses in the webs of 112-lb. and 131-lb. RE. sections; (2) to determine to what extent the stress range can be lowered by revision or modification of the web or other elements of the rail cross section; and (3) to determine by laboratory investigation the fatigue strength of steel in the rail web, including the effect of mill scale, stamped and rolled letters, corrosion, etc., with regard to the range of stress in service conditions. This report consists of six parts (Appendices A, B, C, D, E and F).

Proviso Yard Tests on Rails—Appendix A is a final report on tests conducted at Proviso Yards on the Chicago & North Western in 1943 under the direction of G. M. Magee, entitled Static Stress Measurements in Five Test Rails in Special Tangent Track Under Controlled Loading Conditions. This report describes tests conducted with 112-lb. RE rail; the Denver & Rio Grande Western proposed 115-lb. rail; the 112-lb. TR (torsion resisting) rail designed on the Burlington; the 115-lb. study section A, designed by the research staff of the Engineering division, A. A. R.; and 131-lb. RE rail.

Conclusions of Tests

The conclusions on the Proviso tests were as follows: Eccentric loading of the wheel on the rail head causes a localized stress concentration in the upper part of the rail web, including the upper web fillets, and lateral loading applied in conjunction has little effect on these stresses; the stress immediately below the upper fillet is directly related to the wheel load, amount of

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eccentricity and web thickness; stresses in the upper fillets are related to the same factors and are also related to the length of fillet radius; stresses were moderate in the center portion of the web; high localized stresses were developed in the lower portion of the web and lower fillets as the result of a combination of vertical and lateral loading, and these were little affected by the eccentricity of the load; and a combination of lateral forces and vertical wheel loads produced high longitudinal tensile stresses along the top outer edge of the rail base.

Rail Tests on Burlington—Appendix B is a report of field tests on the Chicago, Burlington & Quincy, at Lathrop, Mo., under the direction of G. M. Magee, entitled Stress Measurements on Four 112-115-lb. Test Rails in Tangent Track and a 4-Deg. Curve Under Regular Train Traffic. This is a report of a series of tests similar to those conducted at Proviso, under actual traffic on both curved and tangent track, except that no tests were made of 131-lb. RE rail. The report is very comprehensive and contains numerous drawings, illustrations, tables and graphs.

Tangent Track Tests

In general, the Lathrop tests serve to confirm the conclusions reached by the Proviso tests. Concerning the tests on tangent track, however, the report states that because of so many variables, possibly in wheel loads and positions of bearing, no comparison can be made of the effect of the different rail designs on the stresses developed, and that the Proviso tests give a more definite comparison. Concerning the tests on the curved track, localized stress distribution in the lower part of the rail web, the lower web fillet, and the base flanges over the tie plate bearing, was found to be of even more importance than was anticipated.

Shearing Stress in Rail—As Appendix C the committee presented a monograph on shearing stress in rail by G. A. Maney, consulting engineer, Northwestern Technological Institute, Evanston, Ill. This monograph includes the results of a study of flexural and torsional shearing stresses in a 131-lb. RE rail computed from strain gage readings made at Proviso. Among the conclusions presented in the monograph are the following: Maximum shearing stresses in a 131-lb. RE rail, measured under a static 40,000-lb. wheel load, were under 10,000 lb. per sq. in., and in intensity did not exceed 25 per cent of normal stresses due to local effects; maximum torsional shearing stresses occurred in the fillet between the head and web of the rail, and were somewhat larger than the maximum flexural shearing stress which occurred at the neutral axis; and the important torsional shearing stresses occurred only under eccentric loading.

Web Failures in Rail—Appendix D is a progress report on web failures in rail by H. F. Moore, research professor of engineering materials, University of Illinois, until his retirement on September 1, 1944, and R. S. Jensen, special research associate of engineering materials, University of Illinois. This report explains the arrangement devised for testing the web strength of rail in a rolling-load machine, and presents a table showing the results of web strength tests with 6-in., 12-in. and 24-in. test specimens. The report also states that a series of fatigue tests have been started to determine the effect of stamped figures on the web strength of rails.

Effect of Spike Maul Blows on Rail Webs at Cold Temperatures—Under Appendix E the committee presents the results of tests to determine the effect of spike maul blows on rail webs at low temperatures. This report describes the tests that were made as the result of finding horizontal web cracks in twenty-five 112-lb. rails within a distance of ¾-mile on the New York, New Haven & Hartford. Since these rails were laid during very cold weather, it was decided to study the effect of low temperatures on the impact resistance of the steel. The report explains that tests at the Bethlehem Steel Company's plant at Steelton, Pa., showed that horizontal cracks, like those encountered in service, could be produced by striking the webs of rails with a spike maul while the rail was at a low temperature.

This led to a series of tests by the Engineering division, A. A. R., at Northwestern Technological Institute, Evanston, in which rails of various sections, including the 112-lb. and 131-lb. sections, were placed in a cold room and cooled for one day or longer to various low temperatures. Cracks were then produced in these rails with a spike maul, irrespective of branding, stamping, rail position or rail section, and the report concluded that it is entirely possible to produce cracks in the rail web by striking the web a heavy blow when the rail is at a low temperature.

Rail Web Failures in Service—Under Appendix F the committee submitted a report on reported rail web failures in service, which contains a table of split web failures (center of web) in 112- and 131-lb. RE rails, reported by 21 roads. The committee states that the data, while not complete, indicate that such failures are not extensive and that the RE sections are basically sound, so far as the web member is concerned.

Eleventh Progress Report on Rail Failures—Also appended to the report of the Committee on Rail is the Eleventh Progress Report on the Joint Investigation of Failures in Railroad Rails in Service and Their Prevention—an investigation which is being conducted by the Engineering Experiment Station of the University of Illinois, in co-operation with the Association of American Railroads through the Committee on Rail of the A. R. E. A., and the rail manufacturers through the Technical Committee on Rails of the American Iron and Steel Institute. Beyond the introduction, this report consists of three parts; a study of control-cooled and Brunorized rails that have failed in service; the results of field measurements for batter of end-hardened rails in service on the Chesapeake & Ohio, near Carey, Ohio; and the results of an examination for weeping cracks in these same rails on the C. & O.

Ties

JOHN FOLEY, Chairman*

This committee submitted progress reports on three of its eight assignments, of which two were offered as information, and one for adoption.

Revision of Manual—Under Revision of Manual, the committee submitted for adoption recommendations for the handling of ties from the tree into the track, to replace the material now appearing in the Manual on pages 3-16.2, 17 and 19, entitled Methods and Practices for Proper Seasoning of Ties, with Particular Reference to Increasing the Service Life and Care of Ties After Distribution.

New Recommendations

The committee states that existing matter in the Manual does not include information supplied in its 1933 and 1937 reports on Most Economical Method of Distributing Ties from Treating Plants to Points Where They Are To Be Used; Economical Uses for Old Ties Which Must Be Removed from Track and Bridges; and Best Practice, from the Manufacture of the Tie to Its Installation in Track. To include this information, and make all of it available in one place, the new recommendations were submitted, which cover manufacture, specifications, piling in the woods, transport, inspection, conditioning, control of splitting, machining, storage, preservation, care after preservative treatment, distribution, care after distribution, care during and after installation, renewals, and salvage.

Renewals and Costs—In accordance with its customary practice, the committee presented tabulations of tie renewals and costs for 1943 and the preceding four years, pointing out that the continuing rise in the cost of ties shows that the supply does not equal the demand. The committee also points out that the average number of new ties installed in 1943 was no higher than the average for the years 1939-43, refuting assertions that unnecessary renewals were common in 1943. The committee states that few railroads averaged less than 15 years' service from their ties during the last few years, and that many averaged more than 25 years, indicating that renewals exceeding five per cent of all the ties in track are the result of local conditions.

Cause and Control of Splitting—In reporting on this assignment, the committee states that consideration is being given to bands, bolts and spiralled dowels to prevent splitting or to close splits, but that no conclusions have yet been reached as to their relative economy. It also mentions the sheltered location of yards, the placement of ties with the sapwood up, and the arrangement of stacks so as not to extend in the direction of prevailing winds, as factors tending to reduce checking and splitting. The committee also refers to the artificial seasoning of wood, tests of chem-

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icals which can be sprayed or sprinkled on lumber, and end coatings—all of which, it points out, are being studied for their effect in controlling or reducing checking and splitting.

Records and Accounts

*H. L. RESTALL, Chairman**

Reports were submitted by this committee on 4 of its 10 assignments, all of which were offered as information.

Bibliography—Following its usual practice, the committee presented a bibliography of books, pamphlets and articles dealing with railroad records and accounts, published between November 1, 1943, and November 1, 1944.

Regulatory Bodies and Courts—The report of the committee contains the customary review of developments during the year in connection with regulatory bodies and courts. Reference is made to the additional work of railway valuation forces caused by the change-over by many carriers on January 1, 1943, from retirement accounting to depreciation accounting. In this connection, the report also outlines the activities of the I. C. C. Bureau of Valuation and the Engineering section of this bureau. In addition, the committee presented an abstract of the Hope Natural Gas Company decision of the United States Supreme Court, which decision, it said, has an important bearing on rate-making procedure.

I. C. C. Valuation Orders, Reports and Records—In its report on I. C. C. valuation orders, reports and records, the committee reviewed the orders of the commission, including a request of the Bureau of Valuation that carriers adopt form B. V. 588-R in reporting a summary of property changes (B. V. 588 returns), and the order abolishing the oath requirement on completion reports and on maps prepared under the orders of the commission.

Depreciation Rates—In its report on the development of service lives and rates for depreciation accruals, the committee explains the depreciation base and the annual accrual of depreciation. Concerning formulas for fixing the annual ammounts of depreciation throughout the life of a property, its report mentions that much has been written on the subject and that the rates furnished by the Bureau of Valuation and those required by the Bureau of Internal Revenue are slightly different. The report adds that the trend of depreciation practices is being given consideration by the General committee, Accounting Division, A. A. R., and that a special committee has been appointed to consider the subject.

I. C. C. Accounting Classifications—In its assignment to keep the association advised of changes in and revisions and interpretations of I. C. C. accounting classifications, the committee followed its customary practice of listing the orders of interest to engineers, issued by the I. C. C. since its last report, and also the new and revised rulings of the Bureau of Accounts. In conclusion, it states that while there have been many changes in accounting classifications during the last year, there are many other changes pending, some of which have been held in abeyance for the duration of the war.

Avoiding Duplication of Reports—One of the assignments of the committee handling this assignment is to develop methods for avoiding duplication of reports and for simplifying and co-ordinating work under the requirements of the I. C. C. and other public authorities. Under this assignment, the committee reported that a joint committee organized by the A. A. R. to review the possibilities for reducing the number of reports and statistics required for managerial purposes, has now completed a report, which will be published in the A. R. E. A. bulletin for June-July, 1945.

* Valuation Engineer, Maine Central.

Yards and Terminals

*W. J. HEDLEY, Chairman**

This committee submitted reports on 4 of its 12 assignments, of which two were progress reports, presented as information, and two were final reports, one with conclusions for adoption.

Produce Terminals—The committee submitted a brief report on this subject, explaining that the term "produce terminal" should include two types of facilities—a railway perishable freight yard and a wholesale produce market—which together comprise the terminal. It points out that the existing material in the Manual relating to produce terminals, with a few exceptions, is considered complete with respect to details, but that it considers it desirable to reassemble the data in such manner as to differentiate between the two types of facilities included, namely, railway perishable freight yards and wholesale produce markets. Accordingly, it plans to submit a report along these lines next year.

Freight Car Repair Facilities—Based upon its report last year on freight car repair facilities and a further study of the subject, the committee prepared a final report, consisting of several proposed revisions of Article 334, page 14-24 of the Manual.

Engine Laundries and Blow-Off Pits—The committee submitted a final report on this subject, which it presented as information. This report outlines the factors that should be considered in constructing engine washing platforms, and includes recommendations as to type, size, location, drainage, lighting, and facilities for oil storage and for housing washing machines. Similar recommendations are given for the location and construction of blow-off pits.

Bibliography—In accordance with its usual practice, the committee submitted as information a bibliography of published articles and papers on passenger stations and terminals; freight stations, terminals and yards; locomotives terminals and railroad shops; and rail and water terminals.

* Construction Engineer, Wabash.

Signals—Interlocking

*H. L. STANTON, Chairman**

In a progress report of the usual type, presented as information, the committee discusses current activities of the Signal section, A. A. R. No report was presented this year on its other assignment—developments in railway signaling.

The report on the Signal section activities mentions new and revised emergency specifications developed in connection with the conservation of vital war materials and issued by a special committee in co-operation with the War Production Board. It also points out that the 11 standing committees of the Signal section are investigating the possibilities of substitute materials in signal equipment and work.

Regarding its regular activities, the committee reports that four chapters of the series of 23 educational chapters on American Railway Signaling Principles and Practice have been revised and that two more are under revision. It also lists 28 subjects that were investigated by the section during the 1943 fiscal year, and then names the revised and new specifications, drawings and miscellaneous matter submitted for letter ballot.

Report on Highways

A. P. BUTTON, Chairman†

The committee presented reports on two of its six assignments. Under Revision of Manual, it presented for adoption a revised plan showing details of striping for crossing gate arms; a new plan for a highway crossing flashing light signal assembly with a 10-ft. or 12-ft. cantilever span; and a new plan of an automatic crossing gate and signal assembly. All of these plans had been prepared by the Signal Section, A. A. R.

Grade Crossing Protection—One of the assignments of this committee is to investigate the comparative merits of various types of grade crossing protection, collaborating with the Committee on Signals and Interlocking of the Signal section, A. A. R., and with the Highway Research Board. In a progress report on this assignment, presented as information, the committee points out that its work during the year was limited to a continuation of the tests of reflectorized crossing signs, other than button-type signs.

One of the types of reflectorized crossing signs under test consists of Scotchlite reflectors. Signs of this type, located in and near Chicago and at various points in Ohio, are reported in either fair or good condition, except that one, at a location where there is considerable dirt and smoke, does not indicate any better results than a painted sign. In addition, the first Scotchlite test signs installed on the Baltimore & Ohio Chicago Terminal, on August 21, 1940, are reported to have been eliminated.

* Assistant Chief Engineer—Signals, Pennsylvania.

† Designing Engineer, New York Central, Lines West of Buffalo, and Michigan Central.

The cement used on these signs failed, but this type of cement has since been improved. The Alzak sign, using Arbuckle reflecting metal, which was installed at 104th street, Chicago, facing east, on March 3, 1941, is reported as still in fairly good condition. A Cuneo, decalcomania sign, installed on the Indiana Harbor Belt at Lawndale avenue, Chicago, on April 5, 1943, and which faces north, is reported in good condition.

On January 7, 1944, a Mirolite sign was installed at Lawndale avenue, Chicago, facing south. This sign has white letters of special glass with a beaded face and a smooth back on a black background. The sign is attached to a Masonite board with special mastic, and is edge-encased in metal molding.

Recent inspection, according to the committee, showed one glass letter broken and some of the black background worn or faded, which, however, is not noticeable at a distance; otherwise the sign is reported still in good condition.

Railway Operation

M. F. MANNION, Chairman*

This committee presented reports on three of nine assignments, two of which were progress reports submitted as information, and one a final report submitted as information.

Railway Electrification—In a progress report on the economics of railway location and operation as affected by railway electrification, the committee discusses the principal reasons for electrification and the inherent advantages of electric power. It also presents a general discussion of the possibility of securing cheaper power in the future and of the fact that increased traffic requirements may justify electrification on some existing lines. In closing its report, the committee lists a number of advantages of electric power as compared with steam power.

Stiffness of Track—Under its assignment to investigate the advantage derived from stiffness of track in improving the economics of railway operation, the committee submitted a report as information, with the recommendation that the subject be discontinued. The report reviews briefly previous studies on train resistance establishing the fact that the relative effect of track rigidity on train resistance is very small, but points out that there are other obvious advantages in increased rigidity, produced by an adequate depth of ballast of the proper type, large ties and heavy rail, from the standpoint of track maintenance and load carrying capacity. The committee concluded that it cannot enlarge or amend the data previously mentioned or published on the assigned subject.

Coordinated Highway Service—In dealing with its assignment to study coordinated rail-highway service and its effect on the economics of railway operation, the committee presented a progress report, submitted as information, which describes in considerable detail the growth of motor carrier traffic, and the development of motor freight traffic, in particular. The report goes on to describe the decline in railroad LCL traffic and the development of co-ordinated rail-highway traffic, and then discusses the federal regulation of motor carriers.

Three Classes of Traffic

The committee states that railroad coordinated motor truck transport is associated primarily with the handling of LCL or merchandise freight, and that this traffic falls into three classes: (1) Terminal LCL transfers; (2) pick-up and delivery; and (3) substituted freight service. Of the latter, the report states that in 1942 the railroads in the United States, as a whole, handled 8.07 per cent of all their LCL tonnage by truck over the road for an average distance of 39.2 miles. It adds that this substitution for rail service generally expedited the service from 24 to 48 hours—largely through a reduction in transfer delays. Referring further to this service, the committee states that it is also frequently more economical, resulting in a substantial saving of box-car days—a consideration of particular importance at this time.

The committee also lists the three methods usually used by the railroads to establish substituted service: (1) by contracting with trucking companies which possess or can secure the necessary common-carrier certificates; (2) by making application for their own certificates and then by operating their own vehicles, or by contracting for truck service under authority of their own certificates; and (3) by purchase of existing trucking companies.

The committee states that it believes that co-ordinated railway and highway service—particularly for LCL freight—has generally improved the service to the public; that it is of great importance to the railways and the shipping public alike; that it should be further developed and made an integral part of railway operation; and that it should be given consideration in terminal design, with respect to yard, station and track layouts.

Waterproofing

J. S. LAHMER, Chairman*

The Special Committee on Waterproofing Railway Structures submitted a brief report explaining that, since the adoption in 1934 of the current specifications in the Manual on waterproofing asphalts, a number of types of asphalt have disappeared from the market or have become increasingly scarce, and other new types have been developed. Accordingly, it recommended that a further set of tests be made to determine whether a revision of A. R. E. A. specifications is necessary or desirable.

Masonry

A. N. LAIRD, Chairman*

A progress report was submitted on one of the nine assignments of this committee.

Concrete Manufacture—On its assignment to investigate progress in the science and art of concrete manufacture, the committee submitted a progress report on the design of concrete mixes, the object of which was to provide methods for use on small or moderate-size projects, that can be used by an inspector with simple equipment to insure the desired strength and durability of concrete with reasonable uniformity and economy. This report is divided into two parts, and appended to it is a brief bibliography for those who may wish to study more fully the subject of mix design.

Part I of the report, which contains a number of tables and a graph for use in determining the proper proportions of trial mixes, covers definitions of terms used; a brief description of the fundamentals necessary for an understanding of mix calculations; and an explanation of two methods of determining the trial mix, one of which utilizes preliminary experiments with materials, and the other, calculations based on data developed from past experience.

Part II of the report provides instruction in the methods of testing the aggregates for those physical characteristics of which use is made in Part I, and also contains a descriptive list of the equipment necessary for making the tests. Tests for quality of materials are not included since the committee assumed that the materials furnished to the inspectors will be in accordance with specifications.

Track — Equipment†

A comprehensive investigation of counterbalance of locomotives for high-speed service has been completed by a joint committee of the A. A. R. on Relation Between Track and Equipment. These tests were reported in A. R. E. A. Bulletin 447, and an abstract of this report will be published in an early issue of *Railway Age*.

The purpose of this investigation was to study the problem of locomotive counterbalancing and its effect on both equipment and track, particularly at high speeds. The study took place over a period of two years and involved 495 test runs over 6,327 test-train road miles, using three types (Pacific, Mountain and Hudson) locomotives. An extensive amount of equipment, such as oscillographs, magnetic strain gages, magnetic accelerometers and amplifiers, was used to measure stresses and vibrations, and thus determine the effect of counterbalancing on stresses and vibrations within the locomotive and on vertical and lateral impacts on the rails.

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* Senior Assistant Engineer, Missouri Pacific.

* Bridge Engineer, Grand Trunk Western.

† Report of special committee of the A. A. R. The tests were conducted under the direction of W. I. Cantley, mechanical engineer, Mechanical division, A. A. R., and G. M. Magee, research engineer, Engineering division, A. A. R.

Water Service

*R. W. DeGEER, Chairman**

Reports on eight of its nine assignments were presented by this committee, including a revision of the Manual, five progress reports, presented as information, one final report, presented as information, and a progress report, presented with the recommendation that the subject be discontinued.

Revision of Manual—Under this subject, the committee submitted plans for timber substructures for water tanks of 50,000-gal. (16 ft. by 24 ft.) capacity, and 100,000-gal. (20 ft. by 30 ft.) capacity, with the recommendation that these plans be approved to replace the plans shown as Figures 1306 and 1307 on pages 13-30 and 13-31, respectively.

Pitting and Corrosion in Locomotive Boilers—The committee offered as information a progress report on its assignment to investigate the cause and remedy for pitting and corrosion of locomotive boiler tubes and sheets, with special reference to the status of the embrittlement investigations. This report quotes at length from the 1936 and 1943 editions of Questions and Answers on Boiler Feedwater, published by the United States Department of the Interior—Bureau of Mines. The committee points out that the recommendation in the 1936 edition of this publication that certain sodium sulfate ratios will inhibit embrittlement, was entirely contrary to railroad experience, and notes with gratification that research in which the A. R. E. A. participated, on the development of the caustic embrittlement detector and the use of tannin and sodium nitrate to prevent embrittlement, has been recognized in the recommendations of the 1943 edition.

Governmental Regulations Pertaining to Railway Sanitation—One of this committee's assignments is to keep the association informed of progress being made by federal or state authorities on regulations pertaining to railway sanitation. In a progress report on this subject, the committee states that activities during the last year were confined largely to consideration of the application of the new regulations of the United States Public Health Service on Drinking Water Standards, and of the Sanitation Manual for Land and Air Conveyances in Interstate Traffic. The committee quoted in full the January 27, 1944, circular letter No. 78 of the U. S. Public Health Service, which asked each state to review its record of interstate carrier water supplies and secure correction of all major defects of those now in the provisional classification, and which recommended that time limits be placed on "provisional" certification—these limits to be 12 months where changes of a major nature are required and 3 months where changes of a minor nature are involved.

This letter precipitated a conference in Washington between the directors of the American Water Works Association and officers of the U. S. Public Health Service, which is discussed in the report, following which, circular letter No. 85 was issued to state health officers by the U. S. Public Health Service. This letter, which sets forth the policy to be followed by the Public Health Service in interpreting the Public Health Sevrice Drinking Water Standards, adopted September 24, 1942, is also presented in full in the report.

The committee also calls attention to further action by the Public Health Service of interest to the railroads in the publication on February 4, 1944, of a Sanitation Manual for Ground Water Supplies, written in a suggested form for enactment into law by states or municipalities. It suggests that the information in this manual be checked carefully by those responsible for these supplies.

Fire Protection—One of the assignments of this committee is to review the principal current activities of the Fire Protection and Insurance section of the A. A. R. A progress report on this assignment reviews these artivities and mentions the fact that large concentrations of war equipment at some points have necessitated changes of authorities in charge of fire protection. It also points out that fire losses in 1943 were greater than in 1942, due chiefly to a few losses of unusual size, and that the special committee on treatment of wood to make it fire resistive is still working on this subject.

Foaming and Carry-Over—A progress report, submitted as information, was presented by the committee on its assignment to study the mechanics of foaming and carry-over in locomotive boilers. This report reviews the results of laboratory investigations on (1) the effect of volume rate of evaporation, and (2) the effect of suspended matter.

Laboratory Experiments

The first part of this report deals with the results of laboratory investigations made at atmospheric pressure with various concentrations of different types of dissolved solids. In these investigations it was found that foam height is a very critical function of the volume rate of steam evolution, and that for any given volume rate there is a limiting foam height which does not depend upon the concentration of inorganic dissolved solids. The experiments gave indeterminate results, however, when organic matter was present, and further investigation on this phase was pointed out as necessary. This part of the report also reviews some tests conducted by a commercial laboratory, made at 100-lb. pressure, which indicate that the concentration to give limiting foam height may be lower at high pressure than at atmospheric pressure. Further experiments, it said, are being made on this phase of the investigation.

The report also presents a table in which the predicted limiting foam height was computed for three large locomotive boilers. This foam height varied from 9½ to 60 in., which, the committee stated, indicates the possibility of designing a boiler that will not foam under ordinary conditions. This part of the report also discusses two mechanical types of anti-foaming devices which force the foam bubbles through tapered restricted openings as they rise in the boiler, causing them to break together and to form large bubbles which do not form foam.

The second part of the report describes certain laboratory experiments on the effect of height of foam when calcium carbonate and magnesium hydroxide are added to the boiler water. The calcium carbonate was shown to have the effect of a multiplier, increasing foam height, while the magnesium hydroxide had a fluctuating effect, first retarding foaming and then increasing the foam height for a time.

High-Speed Watering Facilities for Streamlined Trains—The committee submitted a final report on this subject, offered as information, in which it summarized information on present practice, received from a number of committee members, dealing with coach watering facilities at passenger stations, and with Diesel locomotive watering facilities.

Taking Water Samples—Under its assignment to study methods for taking water samples, the committee submitted a progress report, as information, which states that the instructions necessary for taking water samples are determined to a considerable extent by the purposes for which the samples are collected. The report goes on to summarize the general principles to be applied in the collection of water samples, and then discusses in a general way the taking of raw water samples at sources of supply and in treating plants, and the taking of samples of water in boilers. The report also gives directions for the taking of drinking water samples for the benefit of those railroads that make bacteriological examinations of such water.

Conserving Labor and Materials—The committee submitted a brief report on this subject, presented as information, with the recommendation that the subject be discontinued. Its report reviews the material and man-power situations during the year and offers the following conclusions: (1) To obtain adequate equipment it is necessary to keep in touch with the priority section of the purchasing department so as to be aware of items that can be secured most readily; (2) The use of salvaged and substitute materials and equipment is recommended where such items are available, and the reconditioning of pumps, valves, meters and other equipment should be continued; and (3) the utilization of man-hours is very important, due to increased rates of pay and the decreased number of workmen available.

Wood Preservation

*H. R. DUNCAN, Chairman**

This committee submitted progress reports on 2 of its 11 assignments.

Service Tests of Treated Wood—Under its assignment to investigate service test records of treated wood, the committee presented tabulations showing the

* Engineer Water Service, Great Northern.

* Superintendent of Timber Preservation, Chicago, Burlington & Quincy.

renewal records of ties in the Tamarack test track of the Northern Pacific in Minnesota, and in the Hemlock test track on the same road, in Montana, and similar tabulations based on the 1944 inspection of the test tracks of the Chicago, Milwaukee, St. Paul & Pacific at the Fair Grounds in Madison, Wis., and near Hartford, Wis. The information relative to the test tracks of the Milwaukee is based on data submitted by the U. S. Forest Products Laboratory at Madison.

Creosote-Petroleum Mixtures—Reporting on its assignment to develop specifications for creosote-petroleum mixtures, the committee presented a progress report, as information, accompanied by a brief specification for creosote-petroleum solutions, which it recommends for adoption and publication in the Manual. The committee states that, although some laboratory work has been done during the year, no satisfactory methods of analysis of creosote-petroleum solutions have been developed.

Electricity

D. B. THOMPSON, Chairman*

Progress reports, offered as information, were submitted by this committee on both of its assignments—(1) to report on developments in the application of electricity to railway service, and (2) to report on the principal current activities of the Electrical section, Engineering division, A. A. R.

In its report on the first assignment, the committee reviews briefly a number of developments that may be expected to take place after the war, many of which, it points out, will require electrical maintenance or additional power facilities. These developments include the provision of new Diesel servicing facilities; the increased application of air conditioning; more public address systems; train communication; better illumination in shops, enginehouses and offices; the development of the gas turbine as a prime mover in connection with an electric drive; more extensive use of germ killing tubes for car air conditioning and, air cleaning, and for water purification; and the use of X-ray machines of greater power for the analysis of metals, etc. The report also mentions an increased use of air-cooled transformers, because of lighter weight; the development of silicone resins and their use as insulation in railway electrical equipment to save weight and space; and weight-saving developments in airplane manufacture and in gearing that will undoubtedly be reflected in railway practices.

In reporting on its second assignment, the committee reviewed the work being done by various standing committees of the Electrical section and mentions the two following measures developed to promote greater economy in the use of copper and of rubber insulation: (1) Installation of power feeders inside of roundhouses instead of outside; and (2) the vulcanizing of splices in damaged cables. Of the work being done by various committees, the report mentions a report of the Committee on Power Supply, setting forth the economies realized by the use of capacitors for power factor correction, and a report of the Committee on Track and Third-Rail Bonds, covering injury to welded bonds due to rail-end welding. In the latter report, the committee concluded that less injury to bonds is caused by building up rail ends by electric welding than when gas is used; that the wet asbestos pack constitutes effective protection, but is seldom used; and that removal of the bond, if of the signal type, is the only certain method of preventing injury. This same committee also concluded that in the heat treatment of rail ends, involving higher temperatures than for building up rail ends, pin-type bonds must be removed if they are to be reused.

* Mechanical and Electrical Engineer, New York Central System.

Labor Economics

H. A. CASSIL, Chairman*

Reports were submitted on three of the nine assignments of this committee, all of which were final reports, presented as information.

Maintenance of Terminal Facilities—The report on this assignment—to study the organization, methods and equipment required for the economic maintenance of terminal facilities—is based on information received from a selected group of roads having extensive terminal facilities, in all parts of the United States, as well as Canada, and is divided into three parts, (1) organization; (2) methods; and (3) equipment. Under organization, the report describes the track and bridge and building organizations, which are more or less similar to those on lines outside of terminals. One of the roads, however, reports the use of floating gangs for terminal maintenance, instead of yard gangs with definitely assigned territories. This part of the report mentions that the use of several assistant foremen with sizeable gangs provides greater flexibility, which is desirable because of the variety of work. Practically all the roads reporting also use extra gangs for the larger jobs in terminals.

Flexibility of Organization

Under methods, the report states that substantially the same methods are used as out on the road, and again stresses flexibility of organization and states that cooperation between the maintenance department and other departments, particularly the transportation department, is highly essential in terminal work to avoid traffic interruptions and delays. Several roads stressed the need of competent mobile supervision in large terminals where maintenance men might be working on several jobs miles apart, and recommend that the supervisory staff be provided with automobiles.

In discussing equipment for the economical maintenance of terminal facilities, the committee states that the same hand tools are used as in regular work outside of terminals and that, in addition, many roads are able to justify the use of additional labor-saving tools and machines. In this connection, trucks are mentioned as being of great help for transporting men and material. These trucks, it points out, can also be fitted with special tools and equipment for carpenter, plumbing, electrical maintenance and welding gangs, or with cranes, etc. Some of the other facilities or units of special equipment mentioned for terminal gangs are light rail-mounted cranes; small weed-killing units, and also large weed burners to be used for snow melting; pipe cleaners; portable compressors; and special repair shops for carpenter, machine and pipe work, and for tinsmith and electrical repairs. The committee adds that practically all railroads stress the need for automotive equipment for transporting materials and men, and for off-track maintenance equipment to eliminate expensive work-train service and delays to traffic. In closing its report, the committee submits a list of tools and equipment provided for maintenance gangs on terminals, as reported by the various roads.

System vs. Division Rail Gangs—In a final report on this subject—to investigate the labor economies of system versus division rail laying gangs—the committee summarizes the answers received as the result of a questionnaire, to which 13 roads replied. The advantages of system gangs are listed as follows: (1) The use of a large system gang should reduce the investment in the machinery and camp equipment needed; (2) the efficiency of the men in the large gang should be greater, since they can be assigned the same operations daily; (3) with a small number of gangs there will be less interference with traffic because of fewer work trains and slow orders; (4) system gangs can be adapted better to relaying long stretches out-of-face because the specialized organizations will not be interrupted frequently to close up for traffic; and (5) fewer large gangs should simpify administration and supply problems and also develop more specialized and experienced supervision.

The advantages of division gangs are listed as follows: (1) Smaller gangs can be recruited locally, work nearer home, and the personnel can be kept more intact; (2) division gangs are better adapted to relaying short stretches; (3) when rail must be laid under traffic, train operation will interfere less with smaller gangs; (4) when rail is not available, the smaller gangs can be organized to do other work; and (5) in some instances, the smaller gangs will not require camp equipment.

The committee states that all roads replying to its questionnaire agree that the use of mechanical equipment should be extended as much as possible to offset labor shortages. The committee concludes that there are working conditions suitable for each type of rail-laying gang and that the conditions to be met should determine whether a system or a division gang will be most economical.

Ballast vs. Open-Deck Bridges—A final report was submitted by the committee on the relative economy in labor for maintaining ballast-deck and open-deck bridges and trestles and approaches thereto. In this report the committee states that

* Chief Engineer, Pere Marquette.

although little cost data was found available on the subject, the data and estimates that it was able to obtain indicate clearly that in maintenance, exclusive of replacement costs, ballast-deck bridges and trestles require much less labor than open-deck bridges and trestles. The committee states, however, that when prorated replacement costs are added to the annual maintenance costs, the total costs for the two types of structures become more nearly equal, but are generally more favorable to the ballast deck. The report then lists the reasons for the belief of the committee that ballast-deck bridges are more economical to maintain.

Impact

C. H. SANDBERG, Chairman*

The Special Committee on Impact submitted an extensive final report, presented as information, on its assignment to make tests of short steel spans with open and ballasted-deck floors, including the effects of track inequalities and worn wheels on such spans. No reports were submitted on the other six assignments of this committee.

Impact Tests on Short Open and Ballasted-Deck Steel Bridges—This report covers the entire series of tests made on four railroads, begun in the latter part of 1941 and reported partially a year ago. These tests were carried out under the direction of G. M. Magee, research engineer, Engineering division, A. A. R., and conduct of the tests, analysis of data and preparation of the report were in charge of E. J. Ruble, structural engineer, Research staff, A. A. R. The tests cover impact resulting from both Diesel-electric locomotives, which have no unbalanced weights, and steam locomotives having unbalanced weights in the main drivers. Stress measurements were taken under locomotives operating at various speeds over a battered joint in one rail, located at, or close to the center of the spans, and later without the battered joint. In addition, tests were made on two bridges with ½-in. rubber fabric pads under the regular tie plates, and other tests were made on one span with a welded joint in one rail at the center of the span.

Test Equipment

These tests were made on two bridges on the Chicago, Burlington & Quincy—a 30-ft. open-deck girder span, and a 24-ft. ballasted timber deck girder span; on two bridges on the Atchison, Topeka & Santa Fe—a 20-ft. open-deck beam span, and a 22-ft. ballasted timber deck beam span; on two bridges on the Chicago & North Western—a 26-ft. open-deck girder span, and a 32½-ft. ballasted concrete deck girder span; and on one bridge on the Illinois Central—a 34-ft. open-deck beam span. The tests were made under regular scheduled trains and, on each road, included tests under Diesel and several steam locomotives, operating over a complete range of speeds from 5 m.p.h. up to the maximum operating speeds of the locomotives—100 m.p.h. for the Diesels and 85 m.p.h. for the steam locomotives. Stresses were measured under 256 Diesel locomotive runs and 644 steam locomotive runs, or a total of 900 locomotive runs on the seven test bridges.

The special equipment employed in making the tests included oscillographs and control units, electronic-type oscillators, electromagnetic strain gages, electro-magnetic accelerometers, a high-speed camera, electromagnetic steam pressure indicating gages, etc.

The report contains tables and a large number of graphs showing the results of the tests, together with an analysis of the hammer blow effect, the track effect, the speed effect, the roll effect, and total impact for both steam and Diesel power, with and without battered rail joints. In addition, the report discusses separately the tests made at each bridge.

Main Conclusions

Some of the main conclusions of the report, briefly, are as follows: Actual static stresses are about 90 per cent and 80 per cent of calculated static stresses, respectively, in open-deck spans and ballasted-deck spans. The roll effect on open-deck spans amounted to about 17 per cent and 23 per cent of the recorded static stress, and on ballasted-deck spans, about 17 and 19 per cent of the recorded static stress, for Diesel and steam power, respectively. This roll effect was found to have a critical range of speeds, being of smaller magnitude at speeds above or below the critical. Similarly, the track effect was found to have a critical range of speeds. This effect seemed to increase rapidly up to a comparatively low speed of 20 to 40 m.p.h. for the Diesels and 30 to 50 m.p.h. for the steam locomotives, and then to decrease with a further increase in speed. The report also states that there was a considerable reduction in total impact under the Diesels when the battered rail joint was replaced with a continuous rail, but this reduction was very slight under the steam locomotives.

Concerning total impact, the report concludes that an allowance of 75 per cent of the actual static stress is sufficient to provide for impact under steam locomotives on both open-deck and ballasted-deck spans for speeds of 50 m.p.h. or more. For Diesel locomotives the corresponding figure is 50 per cent for speeds of 30 m.p.h. and over on open-deck spans, and 50 per cent for speeds of 50 m.p.h. or over on ballasted-deck spans.

Other Conclusions

Some of the other conclusions were that the maximum stress in one of two beams well diaphragmed together, amounts to about 15 per cent more than the average stress, and that in one of three beams well diaphragmed together, the maximum stress in one beam amounts to about 20 per cent more than the average. The rubber fabric pads did not reduce the amount of impact. Concerning frequency of maximum stress, about 10 per cent of the trains produced stresses as large as 90 per cent of the maximum. [A more detailed analysis of these studies will be made in an early subsequent issue.]

Cooperation with Universities

R. E. DOUGHERTY, Chairman*

This committee submitted reports on all seven of its assignments, six of which were progress reports, presented as information, and one was a final report, presented as information. These reports were preceded by a brief foreword mentioning the death of Elmer T. Howson, the former chairman of the committee, and outlining the work and war-time problems of the committee.

Appreciation of University Training—The committee submitted a progress report on its assignment to stimulate greater appreciation among railway and university officers of (a) the fundamental importance of instruction in transportation and economics, and (b) the necessity for presenting courses of instruction based on current railway conditions and taught by men of adequate ability and experience. Under this assignment, the report reproduces a letter sent to the heads of schools of engineering of 38 colleges and universities, explaining the objectives of the committee and soliciting "frank and full comment" upon the need for and desirability of setting up adequate courses in Transportation Engineering, and for encouraging graduates to enter the railway field.

Revealing Responses

The report also presents excerpts from many responses to this letter, which were frank and revealing. In general, these responses indicated considerable interest and willingness to cooperate, but many of them mentioned and deplored the lack of railroad interest in college graduates which has existed for years.

The replies also indicated, in general, a belief in a comparative lack of opportunity on the railways, and one letter stated that, "if the railways expect to get very many college graduates, they will have to compete with industrial corporations which make a definite bid for our students—the large industries have apprentice courses and generally offer rates of pay which are very attractive." Another letter states that, "the (railroad) opportunities for employment in the past have been few and the rewards small in comparison with opportunities in industry relating to engineering." Concerning this problem, another letter says: "I doubt whether the course in railway engineering is seriously involved. Personally, I think it is primarily a problem of the attitude of the top management of our American railroads."

The replies also discussed educational trends away from too much specialization,

(*Continued on page 513*)

* Assistant Bridge Engineer, Atchison, Topeka & Santa Fe System.

* Vice-President, New York Central System.

N. R. A. A. *cancels annual exhibition*

Again, war conditions necessitate elimination of show that has demonstrated its educational value over a period of almost 40 years

W. J. Hanna
President

C. H. White
Secretary

AS the American Railway Engineering Association found it necessary, because of conditions created by the war, to cancel its annual meeting this year, so the National Railway Appliances Association, for the same reason, cancelled its exhibition, which for almost 40 years has been so prominent an accompaniment of the annual conventions of the A. R. E. A.

In fact, there is some doubt whether an exhibition comparable to those that have been held year after year, could have been arranged for at this time, since practically all of the companies that comprise the membership of the N. R. A. A. are engaged in war production of various kinds. Many of them have turned over the larger part of their plants to this work and some have found it necessary to increase their plants materially to handle added war-production requirements.

For these reasons, the space available for the production of maintenance equipment and supplies has been so reduced in many plants that delivery schedules are behind normal and it would have been difficult to have obtained the units necessary for exhibition purposes. In addition, the armed forces have taken a heavy toll of the personnel of the railway supply companies, so that it would not have been easy to have spared from other duties the men necessary to conduct an exhibit.

The first of these annual exhibitions was held in 1908 and they were continued without a break until the depth of the depression when they were cancelled for three successive years. This year marks the third successive year that the war has made it necessary again to withhold the exhibition because of the conditions that have been enumerated. These exhibitions have proved to be of high value to railway men, in that they placed before them in concrete form the latest designs of the equipment, materials and supplies with which they were already familiar, and also apprised them of new developments in these products in a way that not only conserved their time but which enabled them to discuss their problems at first hand with the manufacturers.

Board of Directors, N. R. A. A.

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W. J. Hanna, Republic Steel Corporation, Chicago.

Vice-President

C. D. Young, Metal & Thermit Corporation, Chicago.

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C. H. White, Industrial Brownhoist Corporation, Chicago.

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F. P. Cullen, Cullen-Friestedt Company, Chicago.

W. F. Kasper, Fairmont Railway Motors, Inc., Fairmont, Minn.

W. A. Maxwell, P. & M. Co., Chicago.

Stand Ready to Help

By W. J. HANNA*

March, 1945, again finds the National Railway Appliances Association with no alternative—that is, there will be no exhibition. After careful consideration it was the unanimous decision of our board of directors not to hold an exhibition this year. As railway men, you are entirely familiar with the reasons behind this action.

Individually, the members of the National Railway Appliances Association are bending every effort toward the completion of our biggest job—the winning of the war—and we take a pardonable pride in the assistance that they, as individual manufacturers, have been able to render to the railways of America, as well as to the armed forces.

Again, we congratulate every employee of the American railways for having accomplished the impossible, and we are sure that history will record in no uncertain terms the magnificent effort you have already made and are still making.

* President, National Railway Appliances Association, and district sales manager, Republic Steel Corporation, Chicago.

Wants to Cooperate

By C. H. WHITE†

Again we find ourselves at this season of the year when, under normal conditions, we would be looking forward to renewing our acquaintance and friendships with our railway friends and toward the making of new friends. While we have bowed to the necessities created by world conditions, and have cancelled our exhibition, and have done so with regret, we still maintain our relations with the American Railway Engineering Association, and we stand ready at all times to render any assistance of which we are capable to that distinguished body.

We repeat that the National Railway Appliances Association, through its office at 208 South LaSalle street, Chicago, and through its individual members, is ever ready to assist and cooperate, not only with the American Railway Engineering Association and its committees but also with the individual railways, their officers and men.

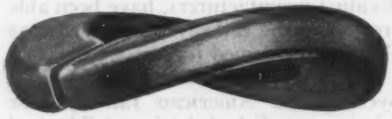
We are in position to understand thoroughly and to appreciate the spendid job each of you has done, and we commend and congratulate you most heartily.

† Secretary, National Railway Appliances Association, and district sales manager, Industrial Brownhoist Corporation, Chicago.

New and Improved Products *of the manufacturers*

New Spring Washer

The Eaton Manufacturing Company, Reliance division, Massillon, Ohio, is now introducing into the railroad field its Reliance Hy-Crome Springlox, a spring washer that is characterized by the fact that it is elliptical, rather than helical, in shape. With this shape it is said to be possible to obtain higher reactive pressures with a washer that is relatively shallow in depth and is made of material that is comparatively small in cross section. Other advantages claimed for the washer are the fact that it affords a three-point bearing on the bolted assembly and that it makes possible the use of shorter bolts.



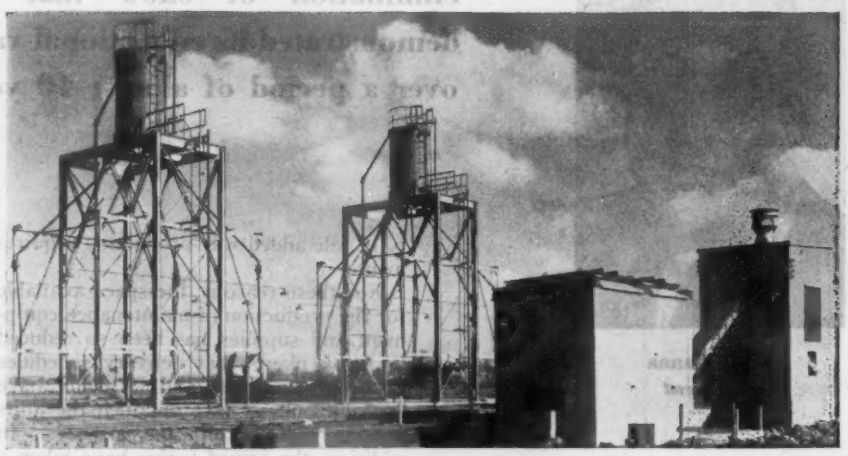
Reliance Hy-Crome Springlox

Improved Cinder Conveyor

A number of improvements have recently been made in the electric cinder conveyor manufactured by the Whiting Corporation, Harvey, Ill., which include changes to permit compliance with vertical car clearances up to 21 ft., the strengthening of all structural parts, especially the superstructure, and modification of the upper end of the trackway and dumping stop to reduce impact.

Improved Cinder Conveyor Permits Vertical Car Clearance Up to 21 Ft.

This conveyor is constructed for single or multiple-track service. The bucket is either 50 or 80 cu. ft. in capacity and is mounted on wheels that operate along a guide track connected to the superstructure and extending underneath the track or tracks. A hoisting cable fastened to one end of the bucket runs through guide pulleys and over a sheave at the top of the structure and down to an electric hoisting winch at the ground level. A stop arrangement at the upper end of the trackway trips the bucket into the dumping position upon contact with the bucket wheels. Reversal of the drive mechanism then restores the bucket to a horizontal position and returns it to the ground by gravity or by means of a retrieving cable fastened to the bucket. The bucket speed is 56 ft. per min.



The Sand Plant Is Equipped to Fill All the Sand Boxes of a Diesel Locomotive Simultaneously

Automatic Sand Plant for Diesel Locomotives

An automatic sand-handling and drying plant, to meet the demands of Diesel locomotives at any point, has been developed by the Ross and White Company, Chicago, and one of these plants has already been installed at a large Diesel servicing point. The plant already built, which is fireproof throughout, is equipped to fill all eight sand boxes of Diesel locomotives simultaneously, without the necessity of respotting them. Another feature of the plant is the use of the steam sand dryers to prepare distilled water for the locomotive batteries.

The plant constructed consists essentially of three units—a concrete wet-sand storage bin with handling apparatus, a concrete sand-drying building, and two elevated sand storage bins located over the Diesel service tracks. Provision is made for unloading sand directly from cars or from ground storage, by means of a railroad crane, into the wet storage bin through removable roof doors on the bin. From the bottom of this bin the sand is discharged through steel chutes onto conveyors by means of which it is elevated to a storage hopper in the sand drying building, directly over two steam dryers. From the dryers the sand gravitates into a gathering hopper, where it is screened and discharged into two drums, from which it is subsequently forced by air pressure into the two elevated dry sand storage bins over the Diesel tracks. The sand is conveyed to the sand boxes on the Diesel engines through lengths of pipe and rubber hose, equipped with telescoping nozzles, the flow being controlled by means of under-cut valves.

The plant is put in operation by starting the wet sand conveyors with a push button, following which all subsequent operations are automatic until the wet sand storage hopper is emptied; then the process must be repeated by again pressing the push button. A pendulum switch, equipped with an inclined mercury tube, stops the wet sand conveyors by contact with the sand when the wet sand storage hopper is filled.

Steam is turned on automatically as the sand enters the dryers from the hopper, and remains on until the last of the sand in the hopper is dried; then it shuts off automatically. As

dried, the sand falls by gravity into the gathering hopper, from which automatic gates control the flow over vibrating screens, into the sand drums below. When the drums are filled, electric thruster valves, controlled by an electric eye, admit compressed air to the drums, closing off the valve entrances at the tops of the drums and forcing the sand into the elevated dry sand bins over the Diesel servicing tracks. When the drums are emptied, the electric eye again operates the thruster valves, shutting off the air lines and opening the valve entrances at the tops of the drums. This operation is repeated automatically to keep the dry storage bins full.

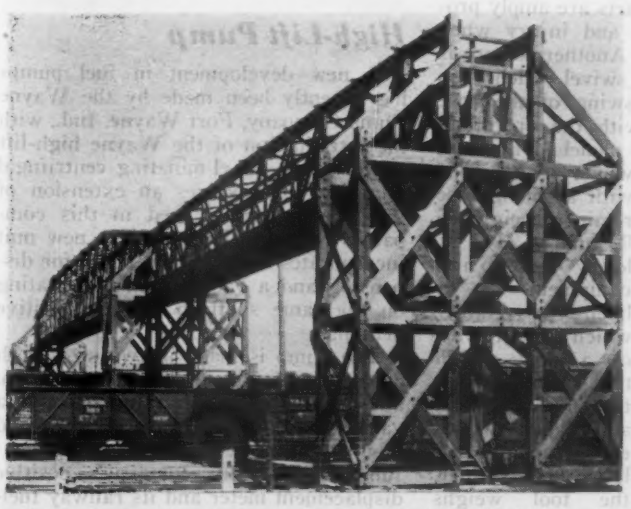
In addition, the elevated dry sand bins are equipped with electric eyes that automatically set the plant in operation—when the overhead bins are emptied—by also controlling the electric thruster valves in the dry sand drums; in this manner a supply of sand is maintained in the elevated drums during the night. Thus, except for filling the wet sand storage bin and the push-button operation involved in each filling of the wet storage hopper over the sand driers, all operations of the plant function automatically.

Fire-Resistant Overpass

Timber treated with fire-retardant chemicals is being used to an increasing extent in railway service. An example of such an application is afforded by a pedestrian overpass recently constructed by the Denver & Rio Grande Western at Denver, Colo. This structure consists of two timber through-truss spans, 90 ft. and 170 ft. in length, which are supported on timber towers, and all the timber used in its construction, except the deck flooring, was treated with Minalith to increase its resistance to fire.

This overpass, which extends over the tracks of the D. & R. G. W., the Colorado & Southern, the Denver & Salt Lake and the Chicago, Burlington & Quincy, contains approximately 56,950 ft. b.m. of Douglas fir. The walkway decking, consisting of 2-ft. by 4-ft. pieces laid on edge, is protected by a wearing surface of Unicrete, ½ in. thick, which is reinforced with poultry netting. Side railings 6 ft. high were provided by fastening chain-link fencing to the truss and tower members.

The timber for the structure was framed by the Weyerhaeuser Timber Company at Longview, Wash., and all of it except the flooring was pressure-treated with Minalith by the American Lumber & Treating Company at Wauna, Ore.



All Timber in the Overpass Except the Deck Flooring Was Treated with Minalith

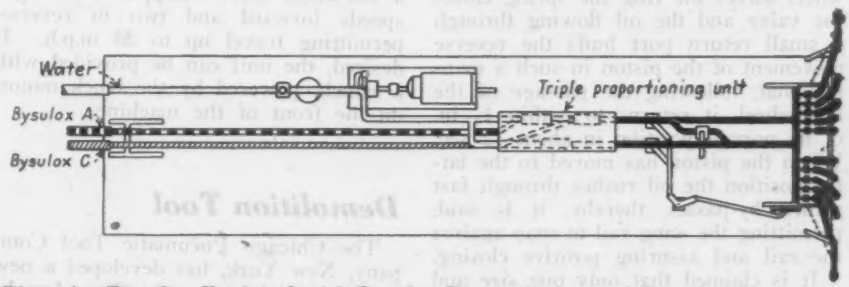
Revised Method of Weed Control

The Bysulox method of weed control of the General Chemical Company, New York, has recently been revised in a number of respects to enhance its effectiveness and to secure greater simplicity of application. The method now provides two highly functionalized liquid chemical compounds, Bysulox A and Bysulox C, which are shipped in concentrated form in tank cars that are incorporated directly in the spray train.

When spraying weeds the two chemical concentrates are transferred by air pressure through pipe lines to the pumping and proportioning units which are located on a flat car in the spray train. By means of a triple proportioning pump unit mounted on the flat car the chemicals are mixed with water in a process that is said to be automatic and continuous. It is said that the two compounds may be instantly varied in proportion or quantity according to the character and kind of weed growths encountered. Since the mixing and proportioning valves are adjustable during the operation, the process is continuous except for the taking on of water when necessary.

Bysolux A is said to be an acid arsenical liquid concentrate for the control of most annual and many broad-leaved perennial weeds, while Bysolux C, consisting of an emulsified toxic oil, is an additive compound to provide improved control for noxious grasses and other noxious perennial weeds. It is also said that this compound stabilizes the toxic elements of the weed killer after application and suppresses regrowth of remaining root stalks and the germination of seed.

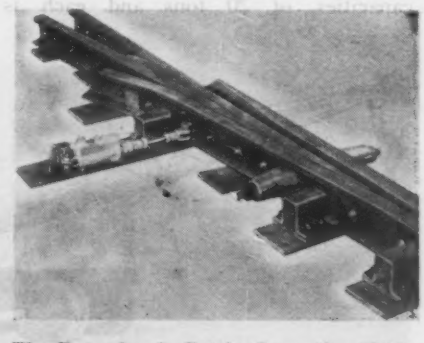
The method of applying the two chemicals has been designed in such a manner that track sections having the most persistent weeds and grasses may be treated with a more concentrated mixture of the two compounds, while on other sections of track having less resistant weeds, a moderate mixture of the compounds may be used. In addition, the apparatus is so arranged that Bysolux A may be applied alone within the tie area, while the ballast shoulder and berm area receive the two-compound fixture for greater effectiveness where the weed growth is heaviest.



Plan of a Flat Car Equipped with Bysulox Proportioning and Spraying Equipment

Hydraulic Retarder for Spring Frogs

The Pettibone Mulliken Corporation, Chicago, has introduced a hydraulic retarder for spring frogs, which is specifically designed to retard and cushion the recoil of the wing rail



The Retarder Is Set in Operation When a Wheel Enters the Frog and Opens the Wing Rail

between wheels of cars. In spring frogs the required spring strength of the frog is such that each time it functions an impact is delivered to the component parts of the structure, which has the effect of loosening bolts and accelerating wear. Without retardation of the spring action, each wheel must compress the spring, thereby imparting a substantial and occasionally damaging blow to the wheel flange.

At spring frogs fitted with the hydraulic retarder the buffing of the spring action begins after the first wheel has opened the spring rail, thereby relieving the frog and following wheel flanges of further repeated impacts. When the last wheel of the train has moved through the frog, the retarder permits the return of the spring wing rail to its normal position within 12 sec.

As the retarder is set in operation by a wheel entering the frog and opening the wing rail, the oil behind a moving piston opens a valve, compressing the valve spring, and flows rapidly to the opposite side of the piston through large openings. As each wheel leaves the frog the spring closes the valve and the oil flowing through a small return port buffs the reverse movement of the piston in such a manner that, following the passage of the last wheel, it returns to within ¾ in. of its normal position in about 12 sec. When the piston has moved to the latter position the oil rushes through fast return by-passes, thereby, it is said, permitting the wing rail to snap against the rail and assuring positive closing.

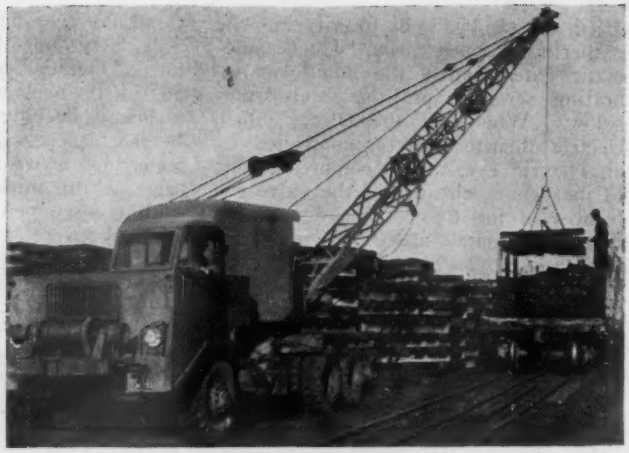
It is claimed that only one size and type of the retarder is required to fit all rail sections, that there is no need for right or left hand variations, that it has no small complicated parts, and that it can be easily dismantled, cleaned and repaired.

Two Thew Products

The Thew Shovel Company, Lorain, Ohio, has added two new units to its line of mobile cranes and shovels, the Thew Self-Propelled Crane and the Thew Moto-Crane "6 x 6", which at present are being manufactured for the armed forces. Both machines have capacities of 20 tons and each is mounted on a rubber-tired under-carriage.

Features of the self-propelled crane include air-powered steering, a full-revolving turntable, and simultaneous hoist, swing and travel. It has four forward speeds up to 7 m.p.h., which, combined with centralized control of all operations by one operator, is said to give the machine the necessary mobility for high-speed material handling in team, classification, supply, stock and industrial yards and terminals. In addition, the front of the truck is built to provide a table for use as a carrier.

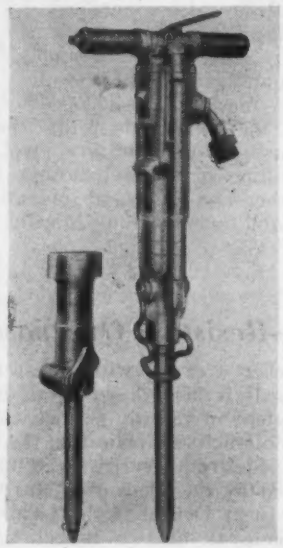
The Moto-Crane "6 x 6" is said to be equally adaptable to either clamshell, dragline or shovel work. It has a six-wheel drive equipped with eight speeds forward and two in reverse, permitting travel up to 30 m.p.h. If desired, the unit can be provided with a winch, powered by the truck motor, on the front of the machine.



The Moto-Crane "6 x 6" Has Eight Speeds Forward and Two in Reverse

Demolition Tool

The Chicago Pneumatic Tool Company, New York, has developed a new medium-weight general-utility demolition tool which is said to be sufficiently powered to meet the demands of all but the heaviest work. Designated as Model CP-115, the new tool has a streamlined housing in which the side rods are totally enclosed. Utilizing the sleeve-type valve with a large bearing area, the new tool is said to provide smooth efficient operation with minimum kick-back. It is claimed to be so fully cushioned that side-rod springs are not required, and that the front head parts are amply protected against shock and injury when "breaking through." Another feature is a gooseneck air-inlet swivel which is so positioned that the swing of the hose does not interfere with the operator's hand. The standard model of the tool, which is equipped with a spring pipe retainer, weighs 55 lb. and is 23⅞ in. long. Optional equipment is a latch-type retainer which is said to be of a new design that eliminates the retainer nut and bolt. When equipped with the latch-type retainer, the tool weighs 59 lb. and has an overall length of 24¾ in. The tool is designed for use with ¾-in. hose.

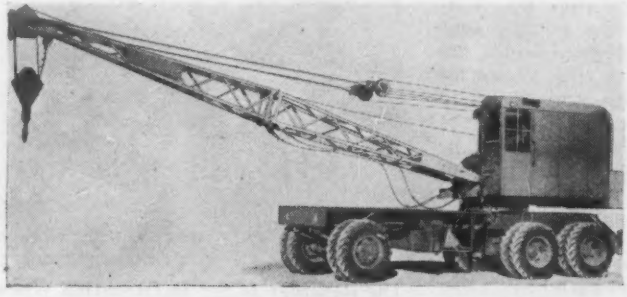


The New Demolition Tool Can Be Equipped with Either a Spring or Latch-Type Retainer

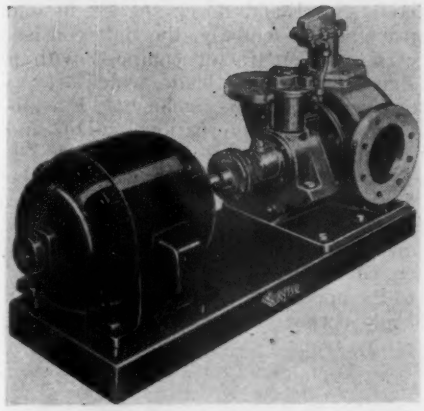
High-Lift Pump

A new development in fuel pumps has recently been made by the Wayne Pump Company, Fort Wayne, Ind., with the introduction of the Wayne high-lift self-priming, air-eliminating centrifugal pump, which involves an extension of the same principle used in this company's centrifugal pump. The new unit incorporates a centrifugal pump for dispensing and a vacuum pump operating on the same shaft to provide positive priming.

The pump is made in two sizes with capacities of 100 to 200 gal. per min. and 300 to 700 gal. per min., and with a variety of pressure characteristics and motor horsepower. It is sold in conjunction with this company's positive displacement meter and its railway fueling systems for Diesel fuel or gasoline. It is said that rapid delivery and meter-



Centralized Control Is Said to Add to the Mobility of the Self-Propelled Crane



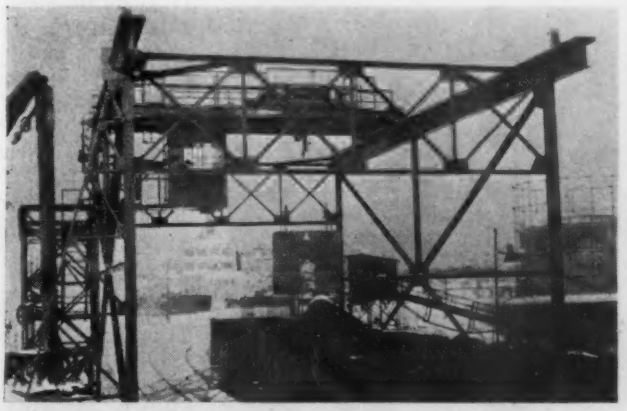
The Pump Can Be Obtained in Two Sizes, 100 to 200 G.P.M. or 300 to 700 G.P.M.

ing accuracy can be obtained whether the storage tanks are above or below ground, the accuracy of metering being promoted by the air-eliminating feature. To minimize agitation, the liquid is pumped with a single impeller.

Among the features of the pump is a variable volume control which is said to permit the use of multiple outlets so that several fueling operations can be carried on simultaneously with a single pump. It is said to be possible, however, to dispense only 50 gal. per min. with the largest capacity pump without damage to the system, or to dispense 50 gal. per min. from each of all the outlets at the same time. Other claims are that the pump can be run dry without harm, and that it recovers its prime quickly and automatically in the event the vacuum is broken.

Coal Slicer Bar and Hoist

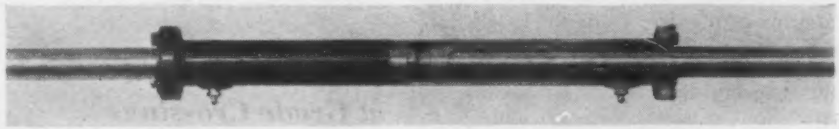
A recent development of the Silent Hoist Winch & Crane Co., Brooklyn, N. Y., is a device that is designed to solve the problem of unloading frozen coal from gondola and hopper cars. The unit consists of a two-drum, electro-hydraulic, friction-clutch worm-geared hoist which raises and lowers a heavy slicer bar that chops the coal apart so that it will pass through the unloading trapdoors in the bottoms of the coal cars. It is said that the hoist can be mounted on any existing crane structure, permitting control of the hoist by the operator in the crane cab. The coal slicer bar, in combination with the hoist, is also said to help move the coal from the various pockets of the hopper car to the trapdoors. It is said that this machine permits fast and clean unloading of the coal, while considerably reducing the amount of manual labor required.



The Coal Slicer Bar and Hoist Can Be Mounted on the Existing Crane Structure

F-M Differential Axle

A new differential axle for motor cars and trailers has been developed by Fairbanks, Morse & Co., Chicago, consisting essentially of two axle halves, with inner sleeves connected to each half, which are fitted inside an outer sleeve provided with end plates and shims for adjustment. The inner ends of the axle halves are in close contact through a film of grease, permitting a small amount of lateral movement which can be adjusted in case of wear by the shims provided between the end plates and outer sleeve assembly. Lubrication of the wearing surface between the inner and outer sleeves can be made through an Alemite fitting near each end of the outer sleeve. A narrow and relatively shallow groove has been made in the outer surface of each inner sleeve to enable the grease to reach the entire wearing surface. As an added safeguard to insure complete lubrication, flat spots are machined on the axle halves and holes are drilled through the inner sleeves.



Provision Is Made in the Differential Axle for Independent Rotation of the Outer Sleeve with Respect to the Axle and Inner Sleeve Assembly

Features of the new differential axle include a rotating surface between the inner and outer sleeves, pin connections between the inner sleeves and their respective axle halves, so that there is no movement between the axle halves and the inside surface of the inner sleeves, and independent rotation of the outer sleeve with respect to the axle and the inner-sleeve assembly. Among the advantages claimed for the new axle are that the wear in the axle assembly takes place between the inner and outer sleeves, which can be replaced; that the large area of wearing surface results in minimum wear and vibration of the parts; and that it is a simple matter to take the axle apart and reassemble it on the car.

Portable Diesel Electric Generator

In answer to a specific request for such a unit from a railroad, the R. H. Sheppard Company, Hanover, Pa., recently developed a portable electric-generator set that is designed to supply power for the operation of electric tools and lights in track or bridge work. Essentially, this unit consists of a Diesel engine operating a 5-kw. generator, and is mounted on a two-wheeled, rubber-tired trailer. Electric lights can be supplied in two arrangements, one with an upright mounting on each corner of the vehicle, with adjustments for height, and the other with portable stands and cable reels so that the lights can be placed at a distance from the unit. It is said that the Diesel engine makes for safe operation and that it can be stored without deterioration or danger of fire.

Portable Bunk Houses

A new type of demountable bunk house has been developed for railroad labor camps which makes use of a multiple-function wall material known as Cemesto. Manufactured by the Celotex Corporation, Chicago, Cemesto is composed of a core of Celotex cane fibre insulating board, surfaced on two sides with a ⅛-in. layer of asbestos-cement which is bonded to the core with a bituminous asphalt adhesive that is said to be waterproof and vaporproof. It is said that the material is fire and moisture resistant and that its rigidity eliminates the need for intermediate supports. No painting or other treatment is said to be necessary.

In the bunk houses constructed with Cemesto, the floor consists of a poured concrete slab provided with a 2-in. by 4-in. wood nailer strip extending around the perimeter of the building to furnish a means of attaching the wall framing to the foundation. The wall framing includes T-shaped posts which are nailed to pre-assembled girders. The framing is assembled on the concrete slab, raised upright into place and then fastened to the nailing strip on the concrete slab by means of screws extending through the lower ends of the posts. Complete win-

dow units with T-shaped jambs to fit the posts are set in place and fastened to the posts with nails or screws. Doors are installed in a similar manner. When the pre-assembled roof trusses are erected they are automatically spaced 24 in. apart by wood blocking attached to the built-up girders, which are drilled for nailing to the trusses. Roof sheathing is applied directly to the trusses and is covered with Mineral-Surface roofing.

Cemesto wall panels are applied and fastened to the posts with screws or nails. Both vertical and horizontal joints are filled with caulking compound or caulking tape, and wood batten strips are then nailed over the vertical joints. The exterior wall construction is finished by applying a facia to the girder, eave strips and rake boards at the gable ends.

The interior partitions embody U-shaped floor and ceiling plates and H-shaped posts into which Cemesto panels are installed. The ceilings consist of gypsum wallboard, ½ in. thick, which is applied directly to the trusses.

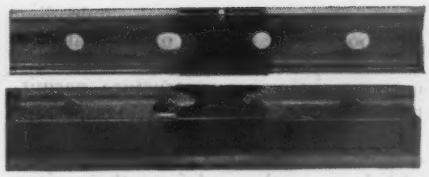
A western road, which has already built several bunkhouses with walls and partitions of Cemesto, is not only planning to construct demountable bunkhouses in accordance with the design described in this article (so that they can be moved from place to place if desired) but is also planning to use the same design in the construction of houses for its section foremen.

Pre-Fabricated Buildings

Pre-fabricated buildings manufactured by Eastern Shore Fabricators, Inc., Philadelphia, Pa., are now being adapted on railroads for use as bunkhouses, kitchens, dining halls, tool sheds, etc. In these buildings the basic structure is a single unit, either 16 ft. or 20 ft. wide, which can be extended, by means of wall sections 8 ft. long, to obtain whatever length is desired. The units are each constructed of heavy walls mounted over a rigid frame. They are delivered knocked down and ready for erection on block foundations, and are said to be completely demountable to permit removal to other locations. A feature of the units is that all 16-ft. or 20-ft. roof units are interchangeable, and that all floor, end-wall and side-wall units are of the same length.

Teleweld Shims

Teleweld, Inc., Chicago, has developed a new rail joint shim, designed to compensate for wear on both top and bottom surfaces of the bar at the same time, which is made in two sizes. One of these, 1/32 in. thick and 5 in. long, is designed for the correction of medium wear, while the other, 3/64 in. thick and 6 in. long, is designed to compensate for heavy joint-bar wear. The shim is said to remain permanently in position and



(Top)—Shows Top Face of One of the Shims on the Upper Surface of a Joint Bar—(Bottom)—Shows Bottom Face of Shim on Underside of Joint Bar

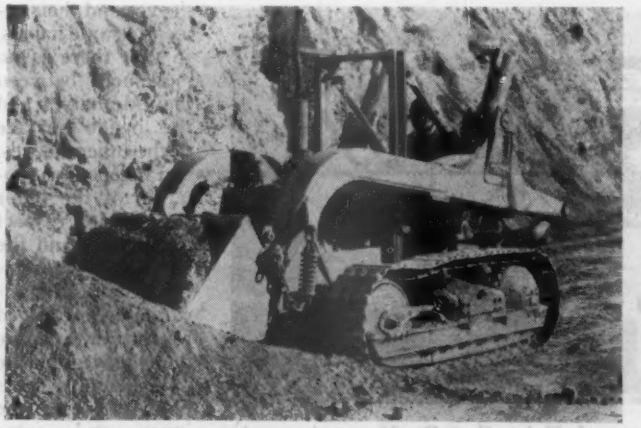
to restore worn bars to their original tight fit. Application of the shims ahead of a rail-welding job will, it is claimed, reduce the length and depth of the welds. It is said that the new shims may be applied by unskilled labor. The bolts are first removed, after which the shim is set in place between the first two bolt holes. When replacing the joint bars they are reversed in order to equalize existing wear. The new shims are made to fit all weights of rail and types of bars.

Ruggedwear Used at Grade Crossings

Among the railroad applications that have been developed for Ruggedwear Resurfacer, a product of the Flexrock Company, Philadelphia, Pa., is its use as a wearing surface on the concrete slabs at grade crossings and as a plaster coat on the rails to absorb vibration. The usual procedure in applying the plaster coat is to mix the material in proportions of 1 part cement, 1½ parts of Ruggedwear and 3 parts of sand. This mix is applied against both sides of the rails to a thickness of ½ in., after which the concrete roadway is poured up to it. This practice is said to eliminate forms and the necessity of using earth or stone fills or other types of insulation designed to protect the concrete slab from the vibratory action of the rail.

Dozer-Shovel

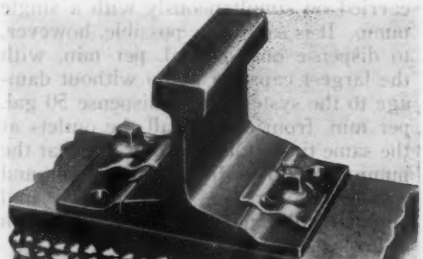
The Bucyrus-Erie Company, South Milwaukee, Wis., has recently developed a combination unit, known as the Dozer-Shovel, which is designed to provide both shovel and dozer service in one machine. Essentially, the unit consists of a crawler tractor equipped with a shovel and a dozer blade, which are interchangeable. This combination is available with the International TD-6 and T-6 Tractractors and the TD-9 and T-9 Tractractors. The bucket used with the T-6 and TD-6 tractors has a capacity of ½ cu. yd., while that used with the T-9 and TD-9 tractors has a capacity of ¾ cu. yd. In both instances a hook attached to the upper edge of the bucket or dozer blade permits the unit to be used as a utility crane.



Dozer-Shovel with Bucket Attachment

New Rail and Tie Plate Clamp

A rail and tie plate clamp incorporating a number of distinctive features has been introduced by Thompson Products, Inc., Cleveland, Ohio. This device, said to be self-tensioning and self-locking, is made of carbon spring steel and consists substantially of a square, horizontally corrugated spring having an oblong hole in the center through which the fastening member is inserted. This is a square-headed lag screw that extends through the clamp and the tie plate and into the tie. To prevent the clamp from rotating it has a depressed tongue that extends downward into one of the spike holes in the tie plate. To assure long service the clamps are treated with a rust inhibitor. No cut spikes are needed with the new clamp. To apply the clamp it is placed in the proper position on the tie plate and rail, and a screw spike is inserted through the clamp and tie plate into a pre-bored hole in the tie. For driving the spike, a stop-controlled impact wrench, or a hand wrench and feeler gage rod, is used. If it is difficult to set the spike screw vertically, it is recommended that it be tapped



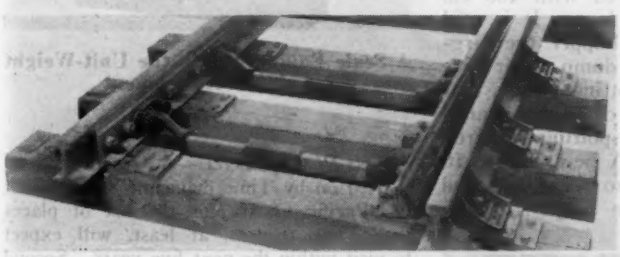
Thompson Rail and Tie Plate Clamp

lightly with a small hammer. To free the rail for renewal, the screw spike is backed out a turn and a half and the clamp is rotated through an angle of 180 deg. Thus, the parts are immediately available for future use if desired.

The new clamp is said to be suitable for use with rail that is either continuously-welded or joined with conventional fastenings, in open track, as well as through crossings and switches. Advantages claimed for the clamp are that (1) it maintains the correct amount of resilient pressure on the rail base and tie plate to meet present-day maintenance requirements; (2) the pre-determined resilient pressure on the rail base at each tie prevents excessive rail creeping in either direction; (3) the proper amount of rail flexing action is permitted without loosening the fastening members; (4) the tie plate is held to the tie, thereby reducing tie wear to a minimum; (5) the rail can be renewed without removing any parts or damaging the tie; and (6) over-spiking and excessive tie splitting are avoided.

Rocker Switch Clip

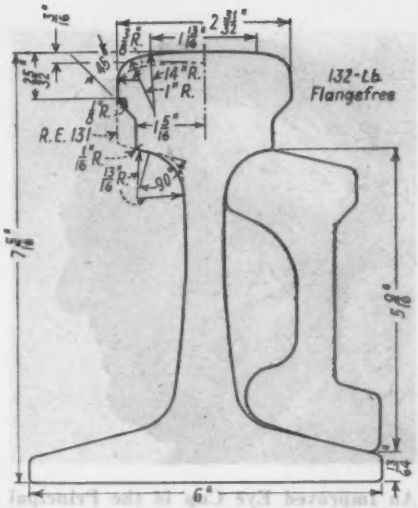
The Cleveland Frog & Crossing Co., Cleveland, Ohio, has developed a new type of clip for use on split switches, which is known as the Rocker Switch Clip. This clip is made of a single steel casting, which is bolted to the switch point and vertical switch rod. It has a curved surface where it abuts the switch point and is attached to the point with bolts equipped with strong springs, thereby permitting a rocking action between the clip and the switch point. It is said that this clip effectively resists the tendency of the switch to roll, that its rocking actions results in little wear to the clip and switch point, and that it requires no lubrication.



A Switch Equipped with Rocker Switch Clips

Flangefree Rail

After fifteen years' observation of its Headfree rail in service, the Thomson Rail Corporation of New York, Philadelphia, Pa., has developed a new rail section, known as Flangefree rail, the purpose of which is to provide more clearance for the wheel flanges and adequate bearings for the joint bars. The new section weighs 132-lb. per yd. Its principal charactertistics, together with those of the joint bars designed for use with it, are indicated on the accompanying drawing.



Cross Section of the Flangefree Rail and Joint Bar, Showing Some of the Principal Dimensions

From the drawing, which shows the new rail design in relationship to the 131-lb. RE section, it is apparent that the principal differences are that the under corners of the head of the new rail are recessed somewhat and that the head is 3/16 in. higher than that of the 131-lb. RE rail. Because of this design it is said that the wear of the the gage side of the Flangefree rail occurs in the form of an upright guiding face instead of a groove, and that, as the wear develops, the wheel flanges remain largely free of the rail. Because of the increased clearance of the under corner of the rail head it is said that there is less abrasion of both the rail and the flanges of wheels and that train resistance is reduced.

It is said also that the greater engagement area of the head arc of the new rail with the top of the joint bar assures precise adjustment, equal distribution of the load and lower unit pressures. Another feature is that the fillet of the rail head is reinforced at the point where experience has shown fillet cracks are most likely to occur. In addition, it is claimed that the load distribution provided by the positive socket bearing eliminates excessive strains in the tops of the joint bars as well as in the head fillets of the rail.

Stanley Unishear

The Stanley Works, Stanley Tool Division, New Britain, Conn., has developed a new portable Unishear, Model No. 208, which is said to be especially applicable in railroad service to the heavy-duty cutting of sheet metal in steel fabricating and repair shops. The unit is 18 in. long, weighs 36 lb. and is operated by one man.

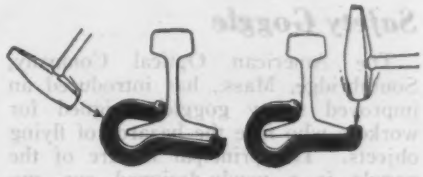
It is powered by a universal-type electric motor operating on either alternating current or direct current of 60 cycles, or less, and can be obtained for operation with 115-volt, 230-volt or 250-volt current. Features of the tool include adjustable alloy steel blades; a duplex handle which is said to permit the operator to grip the tool in a convenient position; a three-wire rubber-covered

The Model 208 Unishear

electric cable which is protected by means of a flexible metal sheath; alloy-steel spur and spiral bevel gearing; full ball-bearing construction; a heat-treated forged-steel yoke; and a light-weight housing. It is said that the tool can cut 8-gage mild hot-rolled steel and 10-gage cold-rolled steel, copper, brass, etc., up to a speed of 10 ft. per min., can make straight or curved cuts, and can be easily moved to the point of use.

Improved Rail Anchor

The Moore & Steele Corporation, Owego, N. Y., has developed an improved Gautier rail anchor, which this company expects to place on the market as soon as work under its war contracts is completed. The anchor is of heat-treated spring steel and may be manufactured from material that is T-shaped, U-shaped or rectangular in



Method of Applying and Removing the Improved Rail Anchor

cross-section. It is claimed that the anchor may be easily applied to the rail without a special tool, that it cannot be over-driven, that it may be applied repeatedly without reducing its holding power, and that it has sufficient take-up to permit it to be applied on old rail. The anchor is said to be so designed that it is not over-stressed in service, and gouging or scraping of the rail base is prevented. The bearing area provided is said to be sufficient to prevent damage to the ties.

Portable Searchlight

Designated as "Big Beam," Model No. 411, a new portable electric hand searchlight has been developed by the U-C Lite Manufacturing Company, Chicago, which is said to be economical in operation and to be effective for illuminating emergency bridge and track repair jobs. The unit is said to project an intense beam of light more than 2,500 ft., or, by means of a snap-on lens, to give the same amount of light over a wide area. It is powered by a heavy-duty six-volt storage battery, which can be recharged without removal from the container. The lamp head can be turned in any direction. The searchlight is balanced for carrying either by hand or with shoulder straps, and by use of a hold-down can be securely anchored to any flat surface. Other models powered by dry-cell batteries are available.

"Big Beam" Searchlight with Recharger

Safety Goggle

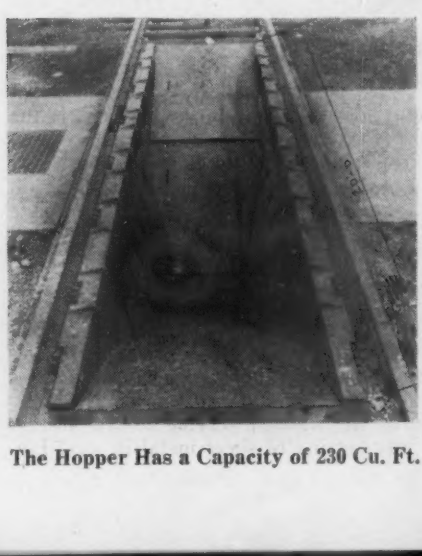
The American Optical Company, Southbridge, Mass., has introduced an improved safety goggle designed for workers who face the hazards of flying objects. The principal feature of the goggle is a newly-designed eye cup which is comparatively large in area and is said to conform to the contour

An Improved Eye Cup Is the Principal Feature of This Goggle

of the face so as to provide greater eye protection, increased ventilation and greater comfort. The cups, which are made of non-conductors of heat and electricity, are provided with air channels in the edges and extra side perforations which are said to produce a natural draft behind the lenses, reducing the possibility of fogging. The new goggles have 50 mm. lenses and are available with white lenses or medium, dark or extra dark lenses.

Larger Hopper for Cinder Plant

The Ross and White Company, Chicago, recently installed an N and W-type multiple-track cinder plant in which the cast-iron cinder dump hoppers under the tracks are of unusual length, being 20 ft. long. Hoppers of this length each have a capacity of 230 cu. ft. as compared with 100 cu. ft. for hoppers 12 ft. long. It is said that with the longer hopper the largest locomotives can dump their fire boxes without respotting, and that smaller locomotives can be cleaned without the accurate spotting required by smaller hoppers. A new 100-cu. ft. capacity bucket has also been developed for use with the large hopper.



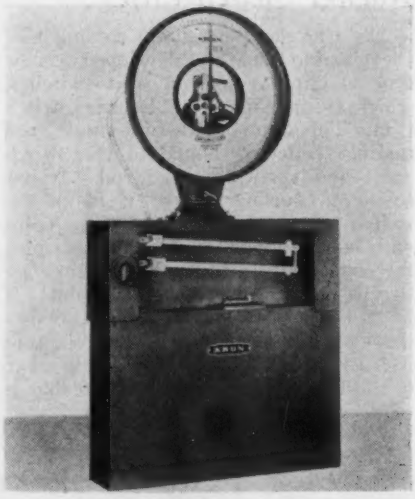
The Hopper Has a Capacity of 230 Cu. Ft.

Scale Attachment

The Yale & Towne Manufacturing Company, Philadelphia, Pa., has developed a new Kron unit-weight cabinet attachment for industrial scales which is said to fulfill requirements for a scale having a high gross weighing capacity with accurate fractional-weight dial chart graduations.

The scale is designed around a unit-weight increment principle, under which, by rotating a handle on the cabinet, from one to seven weight increments, each equivalent to the dial chart capacity of the scale, can be added to the lever system to increase the gross weighing capacity of the scale. The weight increments are indicated in a target on the dial chart as they are added to the lever system.

The scales, which are available for weighing, counting, batching, testing or measuring, are claimed to have a gross weighing capacity that can be increased as much as nine times for heavy-duty service, while still retaining low-dial chart graduations.



A Scale Equipped with the Unit-Weight Cabinet Attachment

POST-WAR TRAVEL.—A recent survey carried on by Time magazine showed that the Pacific Coast tops the list of places that Time readers, at least, will expect to visit within the next five years. Second came the Rockies, and New England and Florida followed. Outside U. S. environs, Mexico came first, followed by the Canadian Rockies and Alaska, and, says Time, "a surprisingly large number hope to travel beyond the North American continent immediately after the war."

RAILROADERS CITED BY CROWN.—British railroad employees, for their "courage and devotion to duty" in five years of war, have been recognized by the awarding of three George Crosses, 28 George Medals, 9 Members of the British Empire, 76 British Empire Medals and 127 Commendations, T. D. Slattery, general traffic manager of the British Railways, noted recently at his headquarters in New York.

University Cooperation

(*Continued from page 504*)

and one letter states that "the present trend in most schools—is to eliminate courses dealing with specialties and to concentrate on courses dealing in fundamentals." Another stated that "the railroads cannot expect to get very much instruction in railway engineering incorporated in a four-year curriculum. We must concentrate on basic subjects." The replies also pointed out that many courses still include railroad curves and earthwork, but that these have been broadened in most cases to include also highway location, curves and earthwork. Similarly, the letters showed that some schools which offer general courses in transportation have broadened these courses, in nearly every case, to include railway, highway, water and air transportation.

Opportunity to Think

In return, a number of replies asked for recommendations as to the training and courses of study that should be included in a course to fit engineers for railway work, one letter, for example, suggesting that the railroads should, "through properly qualified individuals, recommend those things which should be included in courses in transportation engineering, which, necessarily, must be of a somewhat limited nature."

Most replies indicated a belief that specialization should be gained in actual employment, and one letter states that "when the railroads hire college men they should hire them with the realization that they must give them practical training after they get on the job—they should keep in mind always that their great value to the railroad will come from their ability to analyze problems, and their ability to think out new ways of doing things." Furthermore, it states, "these men should be your prospective leaders in every field. They should be the ones who will carry the administrative burden in a few years. This type of man will be worthless unless he is given an opportunity to think."

Acquainting Colleges and Universities with A. R. E. A.—In carrying out its assignment to call to the attention of universities and colleges such information and conclusions developed by the association as is thought to be of special interest or value to them, the committee submitted a progress report, presented as information, outlining the replies received from various colleges and universities concerning the use of the bulletins, proceedings and Manual of the A. R. E. A. in class rooms of lectures, and as to whether the form or scope of these publications should be enlarged. A majority of these replies indicate regular use, and that the form and scope of these publications was satisfactory.

Value of a Technical Education—In a progress report on its assignment to develop means of bringing to the attention of railway managements the value of a technical education as a qualifying factor for young men desiring to enter railway service with a view to advancement, the committee reviews briefly its previous work and then presents a detailed explanation of the student apprentice system on the Southern, started 30 years ago. The report states that while it has not been practicable for the Southern to obtain college graduates under present war conditions, it is proposed to return to the selection of such men as soon as conditions permit. In conclusion, the report states that the Southern will find itself in a distinctly advantageous position in the post-war period through keeping the system alive. It will be in a position to avail itself of some of the best among the men returning to civilian endeavors and to build up a group of young men well qualified for advancement in its service.

Stimulate Greater Interest Among Students—In carrying out its assignment to stimulate a greater interest in the science of transportation among university and college students, the committee submits a brief progress report explaining that research has been initiated to determine the accuracy or inaccuracy of the impression widely prevalent among college faculty members and students that under-graduates entering railway service do not do as well financially as elsewhere.

Use of University Facilities for Research Work—In a final report, presented as information, on its assignment to develop means whereby the facilities of universities may be made more directly available for research work of the association and the railway industry by cooperative effort between the staffs of the universities and the committees of the association, the committee reviews its research on this subject and explains that the engineering colleges that carry on a substantial amount of research have recently formed the Engineering College Research Association, which has issued a directory of member institutions and their principal fields of research.

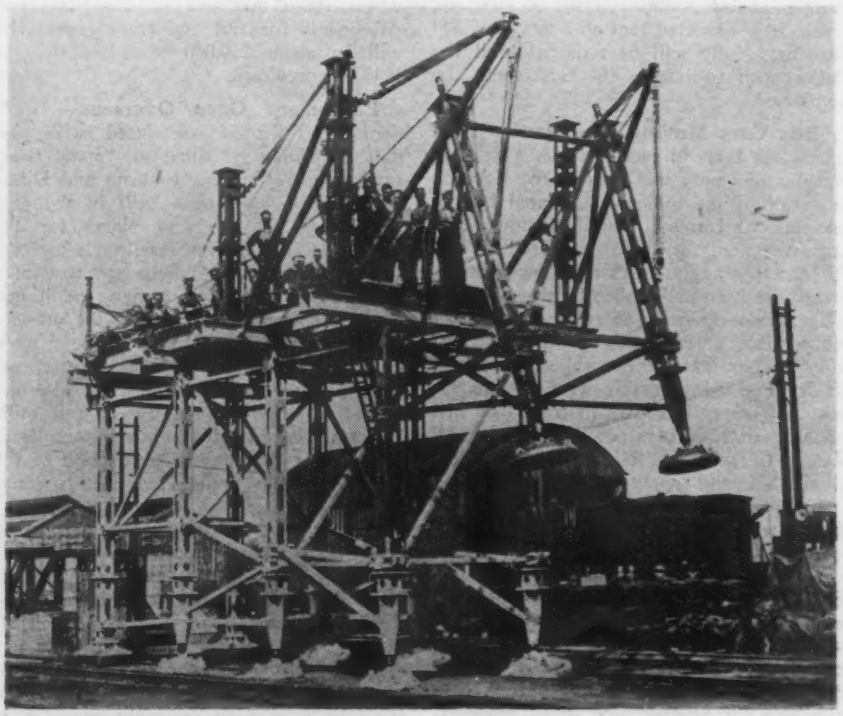
A Convenient Directory

This information, the committee states, is convenient in form and more complete than could have been obtained from individual colleges. This part of the report closes with an appendix analyzing briefly the number, type and geographic distribution of university professors belonging to the A. R. E. A.

Cooperative Education — The committee submitted a brief progress report on its assignment to investigate the co-operative system of education for railway service, telling of a questionnaire that has been sent to a selected group of railway officers and of 20 replies which have been received. The report states that, obviously, the co-operative plan of education is largely at a standstill during the war period.

Investigate Textbooks—On its assignment to investigate textbooks and other material available for instruction in railway engineering, and make pertinent recommendations thereon, the committee states that a tentative bibliography is being compiled, which will be reviewed during the coming year.

* * * *



British Combine Photo

Soldiers Testing a British Unit Construction Bridge

It has lately been revealed that for five years some 44,000 London, Midland & Scottish employees, in seven of the railroad's shops, have been building tanks, guns, planes, assault craft, armored trains and sectional bridges, such as the one above, shown being tested prior to delivery.

Railroads-in-War News

Coal and Grain Tax Equipment and Men

As top-grade cars get scarcer, roads get less steel, but more freight to move

The railroads will be faced in the next few weeks with several unusual situations that will tax their capacity to keep freight moving, the Rotary Club of St. Louis, Mo., was reminded in a talk March 15 by Robert S. Henry, assistant to the president of the Association of American Railroads. The volume of the coal movement will be exceptional, he suggested, in view of the effort to get the largest possible amount above ground during the month of March, while the grain situation continues to give rise to exceptional difficulties.

Not only is there still much wheat held on farms, both in closed and open storage, from last year's crop, but there is also the greatest corn crop in history to be moved, Colonel Henry pointed out. In the East, there are "millions of bushels" of wheat stored in vessels tied up in the harbors on the lower lakes, which must be moved out before the opening of the current navigation season to avoid delaying these boats in resuming the essential traffic in ore and coal. It is expected that an average of 500 box cars daily will be required until the lakes open to handle this movement, he explained.

Box Cars Moving Westward—While there has been in recent weeks a relative surplus of empty box cars in the East, as a result of the difficulties created by the exceptional storms in that area a few weeks ago, the need for these cars in the West is correspondingly great, and special measures have been undertaken by the A. A. R. Car Service Division to restore as quickly as possible a reasonably normal distribution of box cars, the speaker remarked. It is expected that this westward movement of empty box cars in train lots will soon reach 1,300 cars per day through St. Louis, Chicago and other gateways, thus diminishing the supply in the East.

Complicating these difficulties, particularly in the maintenance of a sufficient supply of box cars, is the "gradual degrading of cars," Colonel Henry went on to say. Safety requirements are being met, he explained, and the percentage of cars in such bad order as not to be usable continues at the low wartime level, around 3 per cent. But the proportion of cars available for loading with grain, ammunition, and other commodities requiring the highest class of cars is steadily declining, while the lack of time, labor and materials prevents keeping more of them up to the highest standards.

Provide Hospital Trains as Reverse Lend-Lease

The British government has assigned under reverse lend-lease and without cost to the United States at least 40 hospital trains used in moving wounded American troops in Europe and the United Kingdom, according to Leo T. Crowley, foreign economic administrator. In addition, one British hospital train daily, on the average, has been allocated for American use as needed.

Of the British-supplied trains used by the American forces, 26 are on the continent and 14 in the United Kingdom, said Mr. Crowley. Under reverse lend-lease the British bear both the original and the operating costs of this equipment, he explained.

In the face of this condition, he continued, it appears from the War Production Board's allocations of critical materials for the first half of this year that the railroads will be allowed to build not more than 45,000 freight cars, and no new passenger cars, in 1945. Locomotive output is expected to be from 900 to 1,000 units, of which about 900 will be diesel-powered. Allotments for rail and track accessories will be about 250,000 tons less than in 1944, he predicted.

Equipment Goes Overseas—While domestic railroads are faced with this difficult equipment situation, "many thousands of cars and many steam and Diesel locomotives" have been built in the past two years in American plants for the use of overseas military railroads and the Allied Nations, and "there are now programmed for such uses many additional cars and locomotives." While the production of rail for use outside the United States has not caused much interference with supplies for domestic railroads, and is not expected to, the use of rail mills and suitable steel for producing shells is "seriously curtailing the production of the controlled-cooled rails used in this country," Colonel Henry observed.

Despite these difficulties with the weather and with equipment, the manpower shortage continues to be the "most crucial problem" immediately ahead of the railroads, he said in conclusion. With their men already averaging more than 51 hours per week actually on duty, with present employment about 25,000 under the average for 1944, and with an early prospect of losing to the armed forces a large portion of their 55,000 men under the age of 30 who have had occupational deferments up to now, the railroads' position is difficult, Colonel Henry indicated.

Freight Diesel Use Up 190% in a Year

I. C. C. bureau's 6-months carloading forecast is revised upward

Data indicating the "rather remarkable" increase in the past year in the use of Diesel-powered locomotives in freight service are included in the latest issue of the "Monthly Comment on Transportation Statistics" issued by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. Whereas Class I roads reported an increase in 1944 over 1943 of 1.69 per cent in gross ton-miles of freight service, the total gross ton-miles produced by Diesel-powered engines increased over 190 per cent, the bureau pointed out, even though the ratio of Diesel power to the total rail motive power in this service is still "relatively small," being only 3.59 per cent in 1944.

Increase Mostly in Diesels—As another indication of the increased utilization of Diesel power, the bureau noted that during 1944 the net increase in the tractive effort of all freight service locomotives—that is, installations less retirements—was 2.94 per cent of the total tractive effort available at the beginning of the year; in the same period the increase in the tractive effort of Diesel-powered freight locomotives, however, was nearly 153 per cent. "Of the total increase in freight service locomotives installed in 1944, Diesel installations accounted for over 62 per cent."

Although the use of oil or Diesel-powered engines in yard service began more than two decades ago, the bureau observed, a "marked increase in utilization" of this type of motive power also has occurred in recent years. In 1940, for example, Diesels accounted for 8.90 per cent of the total yard switching locomotive-hours, as compared to 20.72 per cent in 1944. In the same period the corresponding percentage for coal-burning locomotives dropped from 79.34 to 68.14.

Summarizing the figures on passenger casualties in railway accidents in 1944 as compared to recent past years, the bureau disclosed the first decrease since 1939 in the total number of casualties and also a decrease in the number of fatalities, the first since 1941. Both fatal and non-fatal injuries to passengers have increased "greatly" under the stress of war conditions, the bureau comments, as indicated by a comparison of the average annual number of passenger fatalities in the pre-war years 1935-1939, which was 30, to the average for the war years 1940-1944, which was 136, an increase of 353 per cent.

Ratio of Injuries Declines—The in-

crease in averages of non-fatal injuries was much less pronounced, however, being 59.54 per cent for the same period. When considered in terms of volume of traffic handled, it is shown, there has been a consistent improvement in the record since 1939 in the number of passengers injured per billion passenger-miles. The figures for each year are as follows: 1939, 110.20; 1940, 106.23; 1941, 99.16; 1942, 63.17; 1943, 57.22; 1944, 48.01.

Continuing its experimental forecast of carload freight loadings six months in advance, the bureau predicts loadings for July and August 0.5 per cent under the 1944 figures for those months. Its revised estimate of carload loadings for the first six months of this year, taking actual results for January and February into account, is a decrease of 263,836 cars, or 1.4 per cent, under last year's first half, or an increase of 1.4 per cent above the estimate included in the February "Monthly Comment." Major changes upward have been made in the estimates for coal, ore, and "other miscellaneous" freight, as the result of further information, it was explained. The only commodity group in which an increase over last year is expected for the six months is in miscellaneous carload freight, excluding tank car shipments of oil and petroleum products.

Loadings About Same as '44—Loadings of revenue freight for the 5 weeks ending March 31 are expected to average 790,300 cars weekly, or 3.7 per cent above the levels that prevailed during the four weeks preceding, according to the bureau. This figure would amount to an increase of 0.7 per cent over the weekly average for March, 1944. Increases in coal, grain and carload miscellaneous (except oil and petroleum products in tank cars) were expected to more than offset decreases in livestock, coke, forest products, ore, petroleum, and l. c. l.

In its regular survey of operating results, the bureau noted that freight revenues for January were 0.6 per cent above December, 1944, and 1.9 per cent above January, 1944. Making allowance for the occurrence of 5 Sundays in both January and December, 1944, however, January, 1945, reflected a comparative decrease of 2.7 per cent from December and 1.4 per cent from the corresponding 1944 month. The freight revenue index (based on the 1935-1939 monthly average as 100) for January was 208.2, the lowest index figure for a year.

The passenger index, similarly calculated, was 397.6 for January, the lowest index since May, 1943, which was the last month in which this figure was under 400. Actual passenger revenue was 4.9 per cent less in January than in December, 1944, and 0.6 per cent less than in January, 1944.

Ratio to Fixed Charges—Analyzing net income figures for the year 1944, the bureau pointed out that the total for Class I roads was 23.6 per cent under the 1943 total, while the accrued United States tax liability at the year end was practically the same as at the end of 1943. Although fixed charges in 1944 declined 5.1 per cent, there still was a decline in the coverage of fixed charges in 1944 as compared to the previous year. The ratio of income available to fixed charges in 1944 was 1.70 for roads in receivership or trusteeship and 2.42 for other Class I roads, as compared to 2.26 and 2.62, respectively, in 1943. On the other hand, the current position ratio—that is, the ratio of current assets to current liabilities—showed a slight increase, reflecting a decline in liabilities.

While dividends appropriated in 1944 exceeded the 1943 total by 13.7 per cent, this increase was largely accounted for by one road, the Chicago & North Western, the bureau explained. Over 9 per cent of the total of $245,978,216 declared for the year was declared by this road, which was lately restored to company operation after reorganization, and the increase over 1943 was only 3.4 per cent if this road's dividends were not included.

Toot Sweet Express Carries Fast Freight to Front

A new Army freight train, the "Toot Sweet" express, carrying special material requested by forward supply services, now makes the 500-mile run from Cherbourg to supply points in Belgium in 37 hours, Headquarters, European Theater of Operations, has announced. The train starts from Cherbourg at 6 p.m. daily, with 20 cars, and reaches Paris the next day, where it is filled out to 40 cars. The combined train then reaches its destination by 7 a.m. the following day.

All Toot Sweet trains are limited to the 40-car total capacity, and are made up of 20-ton pre-fabricated box cars, assembled in the United Kingdom. Most of the shipments are package size. Train crews are chosen exclusively from railway operating battalions.

The name Toot Sweet cost Maj. Gen. Frank S. Ross, chief of transportation, and Brig. Gen. Clarence L. Burpee, of the 2nd Military Railway Service, $50 apiece, both generals having agreed to put up a $25 war bond as a prize. Of the 670 Transportation Corps personnel who had submitted names, four selected Toot Sweet. The winners were: T/5 Bernard J. Nevins, 764th Railway Shop Battalion; T/3 R. Flagg and T/4 H. Kerley, Headquarters, Motor Transport Service; and T/Sgt. Earl M. Fitze, 8th Traffic Regulation Group.

(Left) T/5 George R. Stockdale, of Chicago, Toot Sweet Fireman, and Engineer T/4 Norris A. Younginer, of Columbia, S. C., Attached to the 740th Ry. Op. Bn., in Belgium

Army Transportation Assn. Elects National Officers

The four-month-old Army Transportation Association, with its more than 9,000 military and civilian members engaged in transportation in this country or overseas, has announced the election of Brig. Gen. W. J. Williamson, chief, Traffic Control Division, Army Transportation Corps, as first president of the organization. General Williamson, who has had more than 35 years of transportation experience, was general traffic manager of Sears, Roebuck before the war. Other national officers include: 1st vice-president, Brig. Gen. Calvin DeWitt, commanding general, Boston Army Base; 2nd vice-president, Col. Luke W. Finlay, executive officer, Office of the Chief of Transportation; 3rd vice-president, Col. Aram Kojasser, chief, Military Personnel, O. C. O. T.; 4th vice-president, Col. James K. Herbert, commanding officer, Los Angeles Port of Embarkation; and 5th vice-president, Brig. Gen. John R. Kilpatrick, commanding general, Hampton Roads Port of Embarkation.

Eligibility for membership in the Army Transportation Association was explained in the *Railway Age* of March 3, page 424.

Emergency Board Appointed

President Roosevelt has appointed an emergency board to investigate a dispute which last week brought a strike threat to the Denver & Rio Grande Western. Employees represented by the five transportation brotherhoods are involved in the dispute which centers around the application of National Railroad Adjustment Board awards.

Members of the emergency board are: Lief Erickson, former justice of the Supreme Court of Montana; Ridgley P. Melvin, justice of the Maryland Court of Appeals; and Russell Wolfe, attorney of Philadelphia, Pa.

Will Coordinate Government Transport Requirements

Appointment of a committee "to coordinate the transportation requirements of the armed services and government agencies so that there will be minimum disturbance of the domestic economy," was announced this week by Colonel J. Monroe Johnson, director of the Office of Defense Transportation. This committee, the announcement said, will act in close cooperation with the recently formed Inter-Agency Committee on Foreign Shipments headed by Foreign Economic Administrator Leo Crowley.

Colonel Johnson named J. H. Aydelott, director of the Division of Railway Transport, as chairman of the O. D. T. Transportation Coordination Committee and liaison officer with the Crowley committee. Other members are representatives of the Interstate Commerce Commission, Army,

Navy, War Shipping Administration, War Production Board, Foreign Economic Administration, and additional agencies may be given representation as need arises. Representatives of the Association of American Railroads and the American Short Line Railroad Association will serve with the committee in an advisory capacity.

The purpose of the Coordinating Committee, Colonel Johnson said, "will be to inform itself concerning the demands for domestic transportation and the domestic portion of export and import transportation so that available transportation may be so distributed as to delay as little as possible the movements of all classes of commodities."

The committee, the O. D. T. announcement added, "will act to prevent overlapping and conflicting demands on the overburdened transportation system by war agencies; and to see to it that essential commodities are moved with the most economical use of transportation facilities and in such a way as to interfere as little as possible with civilian needs. With the benefit of its advice, the Interstate Commerce Commission and the O. D. T. will be better able to distribute transportation properly."

Floods Slow Tank Car Movements

Floods on the Ohio and Mississippi rivers and elsewhere in the central states have forced the use of roundabout routes in the shipment of fuel oil, gasoline and kerosene to the East coast, with an "inevitable reduction" in deliveries, according to Deputy Petroleum Administrator Davies.

Flooding of railroad yards in Pittsburgh and Cincinnati, he said, meant rerouting on lines already overburdened with other essential traffic through oil trains that were scheduled to pass through those points. Barge movements of oil on the Ohio were brought almost to a standstill when that river began rising, he explained, and loaded barges were diverted from Ohio river terminals to Gale, Ill., near Cairo, whence the oil was handled in tank cars.

How much the floods would affect the Atlantic seaboard movement of oil could not be predicted, Mr. Davies said, but he thought rail deliveries would fall off from the daily average of 517,291 barrels reported for the week ended March 3, which was the best figure reported since the first week in January, when the effect of bad storms began to be felt most severely. The full effect of the delays in tank car and barge movements resulting from the floods will not be felt in the East coast area for "several weeks," in his opinion.

Lend-Lease Reports on Railroad Equipment Sent to Russia

In announcing March 14 that the first ships carrying lend-lease cargoes from the United States to the Soviet Union by way of Black Sea ports have reached their destination, Leo T. Crowley, foreign economic administrator, pointed out that much of the material now moving to Russia under lend-lease is intended to improve the Soviet transportation system.

In the 15 months ended January 31, he revealed, more than 10,000 separate units of railroad rolling stock have been shipped to Russia. These shipments included 1,278 locomotives, 27 Diesel-electric locomotives, 8,340 flat cars, 1,000 dump cars, 100 tank cars, and 10 heavy machinery cars. Other material shipped in the same period for use on the Russian railways included 509,580 tons of rail, 24,350 tons of mounted wheel and axle sets, 35,554 tons of car axles, 29,944 tons of locomotive and car wheel tires, and 22,020 tons of car wheels.

Since the inception of lend-lease a total of 15,770,000 tons of materials have been shipped to the Soviet Union, he continued. This included many combat vehicles and guns, large quantities of foodstuffs, chemicals and explosives, 355,059 trucks, and nearly one billion dollars' worth of machinery and equipment.

Materials and Prices

The following is a digest of orders and notices that have been issued by the War Production Board and the Office of Price Administration since March 3, and which are of interest to railways:

Copper—Increased demands of the armed forces require additional restrictions on the use of Copper, W. P. B. announced in amending Order No. M-9-C. Incorporated in the revised order are a number of changes designed to clarify its provisions and to bring it into conformity with other W. P. B. orders that limit the use of copper.

De-Watering Pumps—During the period March 3, through May 15, 1945, dealers' stocks of new de-watering pumps in 12 states: New Hampshire, Vermont, Massachusetts, Connecticut, New York, Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky and Missouri, where flood conditions are expected, may be sold only on W. P. B. authorization, excepting pumps needed to fill orders from a war agency or those rated AAA. Lease of used de-watering pumps is permitted only on W. P. B. authorization. This action, taken by an amendment to Direction 2 or Order L-192 (issued March 2) is designed to make certain that pumps will be available where needed to combat flood conditions, W. P. B. said.

De-watering pumps controlled by the direction are self-priming centrifugal pumps of sizes 1½ in. to 6 in., inclusive.

Application for authorization to purchase or lease the pumps from dealers is made by the prospective purchaser or lessee to the nearest W. P. B. field office, giving the name and business of the applicant, number and size of pump or pumps required, if it is to be purchased or leased, dealer's name if known, and statement of why the pump is needed. In case of emergency this information may be given to the W. P. B. field office by telephone and confirmed by letter within three days, the direction states, and the dealer may receive notice by telephone that W. P. B. authorization has been granted.

Heavy Duty Tires—In announcing a fifty per cent cut in the number of heavy duty tires allocated to meet essential commercial motor vehicle requirements for the second quarter of 1945, Col. J. Monroe Johnson, director of O. D. T., warned truck and bus operators that the number allocated may be subject to further reduction. He called attention to shortages of carbon black and other tire components recently announced by the W. P. B. The shortages, Colonel Johnson pointed out, have resulted in the temporary cessation of seven-day-week tire production, a four-month program adopted by labor and management in the tire industry in December, 1944 to increase heavy duty tire production to meet increased military and essential civilian needs.

As claimant agency for civilian transportation, the O. D. T. requested 2,781,000 truck and bus tires to meet basic requirements for replacement purposes for the April, May and June period. The War Production Board allocated 1,410,000 or 50.7 per cent of the amount requested, leaving a shortage of 1,371,000 tires.

The amount allocated will restrict distribution to a rate of 156,000 tires per month in the sizes 8:25 x 20 and larger and 314,000 tires per month in sizes 7:50 and under. The second quarter total is 431,400 over the first quarter total of 978,600; the larger sized truck and bus tires being available at the rate of 110,200 a month during the first quarter and smaller sized tires at the rate of 216,000 a month.

Paint, Varnish and Lacquer—The over-all lead situation is tightening, and available stockpiles of natural resins are rapidly diminishing, W. P. B. officials informed the Paint, Varnish & Lacquer Industry Advisory Committee at a recent meeting held in Washington. Greater restrictions on the use of lead in somewhat the same fashion as the restriction of oil under M-332 may be necessary in the near future, W. P. B. told the committee members. However, since any such action would obviously present a tremendous problem in the case of paste white lead in oil, the agency assured the industry that no action will be taken until all sides of the problem are thoroughly explored.

W. P. B. told the committee members that consumption of alkyd resins for approved military end uses has increased approximately 15 per cent in the last few months with no accompanying increase in the availability of phthalic anhydride for resins. For this reason, W. P. B. said, drastic reduction in allocations of alkyd resins for March has become necessary, as little hope exists for bringing supply into balance with demands except by eliminating certain uses currently allowed. Furthermore, certain specification changes may have to be made shortly.

The committee also was told of the continuing tight supply of phenolic resins and urea melamine resins, as a result of formaldehyde shortage and manpower difficulties. Certain types of phenols are not available in sufficient quantities to meet increased requirements, W. P. B. said.

Roofing Products—Further standardization and simplification of asphalt and tarred roofing products have been established to conserve the supply of dry felt used in making these products and to increase production of types needed for overseas use. Demands are increasing, due chiefly to heavy overseas requirements and to shortages of other roofing materials, such as metal and wood shingles, W. P. B. said.

L-228 as amended prohibits the manufacture of smooth surface roll roofing (Type 4, Grade B or C), and cap sheet (Type 7). These types are of such low grade that they do not meet Federal specifications or the tests of fire underwriters. W. P. B. said. In general, they are not acceptable for military requirements or for lend-lease use. Specification changes in saturated and coated felt built-up roofing products (Types 5 and 6) reduce the maximum permissible finished weight, and specify the minimum dry felt weight instead of leaving it optional, as heretofore. The order limits manufacture of asphalt and tarred roofing products and asphalt shingles to those specified in Schedule A.

Prices

Southern Pine—A request by the Southern Pine Industry Advisory Committee on March 8, for an immediate maximum price increase of $5 per M. f. b. m. in the ceiling price for southern pine lumber has been denied by the O. P. A., pending examination of cost and realization data to be supplied to O. P. A. by members of the industry.

Used Iron and Steel—Steps to be taken to bring the sale of all used iron and steel products under one regulation were discussed by the Reusable Iron and Steel Industry Advisory Committee at its recent organizational meeting at Washington, D. C., with officials of the O. P. A. The committee recommended the revision of MPR-310.

GENERAL NEWS

I.C.C. Can Take Notice of Its Own Decisions

Commission also holds that court ruling is no bar to rehearing of case

Asserting its right to take official notice of its own decisions, thereby applying general findings to substantially similar specific situations, the Interstate Commerce Commission has also held in a recent decision that the decree of a court does not deprive it of jurisdiction and is no bar to further commission proceedings in the case involved. The decision by a six-to-five vote of the commission is in the report on rehearing in docket No. 28813, Summer and Company v. Erie Railroad Company et al.

The case involved the carload rates on scrap iron and steel from South Bend, Ind., to Mansfield, Ohio, from Hastings, Mich., to Massillon, Ohio, and from Lansing, Mich., to Sandusky, Ohio, and the commission has affirmed the findings of Division 3's prior report which condemned the assailed rates, awarded reparations, and found that rates for the future will be unreasonable to the extent that they might exceed rates made 70 per cent of the basic scale of rates on iron and steel articles prescribed in *Iron and Steel Articles,* 155 I.C.C. 517. Because of this reliance on the basis prescribed in that general proceeding, the division's report, as the commission now puts it, "was made rather brief and was less explicit than would ordinarily be considered desirable."

Roads Got Injunction—The defendant railroads brought suit in the United States District Court for the Southern District of Ohio, Eastern Division, and the court permanently enjoined the execution of the commission's order (Civil No. 68, *Erie R. Co. v. United States,* dated March 24, 1944). The court stated that "no evidence was introduced which tends to establish the unreasonableness of the rates. On the contrary, the decision of the commission recognizes that the evidence establishes that the rates are reasonable; but on the basis of its decisions in other cases, it held that the rates were unreasonable. This constitutes prejudicial error. A decision that is not grounded on evidence fails to apply the standard of 'full hearing' set by Congress as a guide to the commission. . . ."

Following the court's ruling, the commission vacated Division 3's order and reopened the case for rehearing. "At the rehearing," the present report says, "defendants appeared specially for the purpose of challenging our jurisdiction. They did not appear for any other purpose. Under such appearances defendants contend that these proceedings have been adjudicated by the court . . . and, therefore, that we have no jurisdiction in the matter."

Jurisdiction Retained—After expressing its own view that the court's action "did not deprive us of jurisdiction over the subject matter of the complaint and is not a bar to further investigation to determine whether there is justification for the prescription of reduced rates," the commission proceeded, via the "official notice" route, to reach the same conclusions as Division 3. It cited some 19 decisions wherein the 70-per cent basis was prescribed as reasonable for scrap iron and steel within Official Territory, noting also that "we have often said that one of the best tests of the reasonableness of rates is comparisons with other rates on the same commodity in the same general territory."

"In the cases cited," the report says in another place, "we have drawn the general conclusion that Official Territory is a homogeneous rate region in which the conditions of transportation and traffic require, or at least justify, uniform levels of rates, with certain exceptions and qualifications which are explained in the reports but which are not here pertinent. Decisions in major proceedings such as those cited determine the broad outlines of regulatory policy which of necessity must be followed in minor proceedings such as the one before us here. The practical administration of the Interstate Commerce Act does not permit of any other course. . . .

"Evidence to establish in a satisfactory manner the nature of the transportation and traffic conditions throughout an extensive territory is necessarily of an elaborate character and requires the services of numerous transportation experts. . . . To assemble and produce such evidence is expensive and time-consuming. Having examined such evidence carefully and announced our conclusions thereon, we be-

(*Continued on page 524*)

Lacey To Retire on June 30 from Valuation Bureau

Robert A. Lacey, director of the Interstate Commerce Commission's Bureau of Valuation since September 1, 1943, will retire on June 30 after more than 33 years in government service, of which about 31 years have been with the I. C. C. The commission's announcement of March 14 was accompanied by another which revealed that George B. Douglass, a member of the Bureau's Washington, D. C., staff since 1921 and prior to that time in its field service, has been appointed director, effective July 1.

Brown and Parmelee Rap New Pension Bill

Pelley says proposal violates spirit of 1937 pension act agreement

Revelle W. Brown, president of the Reading, is opposed to the Railway Labor Executives' Association program for liberalizing the Railroad Retirement and Railroad Unemployment Insurance acts because it would "impair and impede progress in the railroad industry," and make it "difficult or impossible for railroads to provide jobs in the future." Mr. Brown made his statement last week at House interstate and foreign commerce committee hearings on H. R. 1362, the bill embodying the R.L.E.A. program which is sponsored by Representative Crosser, Democrat of Ohio.

Bargaining Discarded—He was preceded by J. J. Pelley, president of the Association of American Railroads, who told of the collective bargaining negotiations leading up to the 1937 agreement between labor and management on the present retirement act. The A.A.R. president indicated his view that the present unilateral proposals of R.L.E.A. comprise a breach of the spirit of the 1937 agreement. "The system then agreed upon," he said, "was to be adjusted to changing conditions, of course, as it had to be, but certainly it was the spirit of the agreement that the system itself should continue to be one of mutual benefits and obligations, and that such adjustments as might be found necessary should be the subject of conference and joint consideration by the parties to the original understanding."

Mr. Pelley confined his testimony to a discussion of the 1937 agreement of which he spoke with personal knowledge, having been a participant in the conferences. He conceded that there was "no specific agreement" as to future changes; but it was his own thought "at the time, and since," that any substantial change in the plan "would be subjected to the same procedure of collective bargaining." Moreover, Mr. Pelley recalled discussions and comment which indicated to him that the labor representatives in the 1937 negotiations felt pretty much the same way.

Pension Act Endangered—As President Brown of the Reading appraised it the R.L.E.A. program would endanger the present retirement act, adding new features "at a cost in taxes which employees and management cannot afford in normal times." The proposed unemployment act amendments, including the addition of sickness and maternity benefits, would "raid" the unemployment fund, thereby defeating

the purpose for which that fund was created —"to give railroad employees some measure of security in periods of widespread unemployment."

Mr. Brown told the committee how he had risen from the ranks, thus qualifying himself "to discuss the harmful effects of this legislation—not only upon the railroad industry but also upon the employees themselves." When he was on the way up he learned that "the best security in the world is a steady job," and he still believes it. Like previous railroad witnesses, Mr. Brown had some comment to make on the "assumptions and guesses" of Railroad Retirement Board Chairman Murray W. Latimer. In that connection he recalled that previous Latimer estimates formed the basis of the present retirement tax set-up which has proved inadequate, on an actuarial basis, to support the benefits.

Make Present Pensions Sure—As the Reading president sees it, the first step should be to meet the provisions of the present retirement act with taxes high enough to insure its solvency. To this end he believes conferences between management and the employees must be held soon. With respect to the unemployment tax of three per cent of payroll, paid entirely by the railroads, Mr. Brown thinks the railroads should have relief in view of the enormous reserve already built up. The unemployment tax was levied for specific benefits, he said, and "it was certainly not the intention to have the railroads contribute huge sums of money—upon the theory that the Railroad Retirement Board would find some way to spend it."

For this position Mr. Brown found support in Mr. Latimer's writings. From the R.R.B. chairman's book, "Industrial Pension Systems," published in 1932, he quoted this statement: "Obviously, it would be contrary to public interest, to permit charges in respect of pension systems to be passed on to the public, and then to fail to prevent the diversion of funds accumulated through such charges, for purposes unrelated to their original objective." If, as the foregoing says, it is improper to divert pension funds, the Reading president suggested that "it is likewise improper to divert unemployment insurance funds to other purposes."

Mr. Brown's specific suggestion was that Congress establish a minimum and a maximum for the unemployment reserve fund. He added that when the fund drops to the minimum, the railroads should be required to contribute; when the fund reaches the maximum, the contributions should cease temporarily.

Latimer's Two Bad Guesses—Summing up on the differences between the retirement and unemployment funds, Mr. Brown said: "We have a Retirement Act which is under-financed, and we have an Unemployment Insurance Act which is over-financed. The tax rates prescribed by these two laws are out of balance. They are out of balance because Mr. Latimer underestimated the pension needs—to which the employees contribute. And he overestimated the unemployment needs—to which the employees do not contribute."

The Reading president dismissed Mr. Latimer's contention that excess profits taxes would take care of most of the proposed new retirement taxes with advice to the committee that "in normal times, railroad managers are not required to spend much time worrying about profits taxes." In discussions with railroad employees, Mr. Brown has found that "very few" of them "know anything about the bill, and still less men seem to have any interest in it." All of them, however, "are very much interested in the deductions now being made from their wages," and Mr. Brown doubts "if they expect the increased deductions which this bill has in store for them."

How Much It Will Cost—As indicated above, the retirement act taxes are paid half by the railroads and half by the employees. The present law provides that such taxes, now 6½ per cent of payroll, will rise to a maximum of 7¼ per cent. Under the bill the tax would become 11½ per cent on June 30 and rise to a maximum of 12½ per cent after December 31, 1951. Thus enactment of H. R. 1362 would immediately increase the levy on employees from 3¾ per cent of their taxable wages to 5¾ per cent. For a $200-a-month man, Mr. Brown calculated, this would be a rise of nearly 77 per cent—from $6.50 to $11.50 a month. He went on to assert that neither the railroads nor the employees could have stood even the present levy "during the early "Thirties," adding that "no one can assure us that depression will not come again."

Giving Reading figures as "typical of many railroads," Mr. Brown noted that in 1944 it was taxed $1,586,000 for the pension fund, and $1,463,600 for the unemployment fund. The proposals in H. R. 1362 would have added $1,221,220 to its retirement-fund tax, making the total payroll levy $4,393,220. The additional $1,221,220 would almost wipe out the effect of 10 years' debt reduction which has cut Reading fixed charges by $1,441,046 annually. "Mr. Latimer's proposal," as Mr. Brown put it, "may create jobs in his bureau—it won't make jobs and wages on the railroads." He added that "no one can read Mr. Latimer's testimony without a realization that he has a pet scheme for an entirely new system of social security—and he is here to sell it."

Reliable Advice Needed—In closing Mr. Brown told the committee that it should turn the proposals back to their sponsors with the suggestion that collective bargaining be tried first. He conceded that collective bargaining conferences might not produce an agreement, but he insisted that it would produce "an actuarial study made by a competent, unbiased authority—a study that would tell us in simple language, and with a minimum of assumptions and guesses, not only where we were going with the proposal, but where we would be when we got there."

Following Mr. Brown's presentation, Representative Wolverton, Republican of New Jersey, ranking minority member of the committee, suggested that it might be well for the parties to pursue procedures like those which led to the 1937 agreement. The tax deficiency in the retirement system seemed to Mr. Wolverton of primary importance, and he thought that would no doubt come up for discussion at labor-management conferences. The New Jersey congressman went on to say that he hasn't been satisfied that the proposals in H. R. 1362 come from the employees, and he would like to see that situation cleared up.

He noted that the bill is not supported by the Brotherhood of Locomotive Engineers and the Brotherhood of Railroad Trainmen, who represent two-thirds of the operating employees. And because he thinks that all interested parties should have an opportunity to consider the proposals, he hoped that his remarks might result in cooperative efforts—first among the unions themselves, and then between management and labor.

Would Halve Net Earnings—This week's sessions of the hearings opened with the presentation of Dr. Julius H. Parmelee, director of the Bureau of Railway Economics, who made a lengthy statement discussing various provisions of the bill and the estimates submitted by Chairman Latimer of R.R.B. In the latter connection, he noted first that Mr. Latimer referred to his estimates almost wholly in terms of given percentages of annual railroad payrolls, making large use of the current annual payroll of $4.4 billion.

As the B.R.E. director pointed out, fractional percentages of such a payroll mean large amounts of money—one-tenth of one per cent would add up to $4,400,000 a year. He also pointed out that when the stimulus of war traffic disappears, the payrolls will decrease, bringing down the number of dollars produced by percentage levies on such payrolls. Relating the increased taxes proposed in the bill to net earnings, Dr. Parmelee calculated that the additional levy would have absorbed 50 per cent of

Public Enterprise in the Bus Business

If you are in any kind of transportation business except railroading, you don't have to raise the capital for and build your own terminals. You just let some government body do the job for you.

The Port of New York Authority, on March 12, disclosed its proposed plans and location for a $13,000,000 union bus terminal for all bus lines operating to and from midtown Manhattan. The project, which is said to have the "hearty approval" of New York's Mayor F. H. LaGuardia, could be in operation by 1947, depending on the end of the war and agreement of bus operators. The new structure, which would occupy a 200 by 800 ft. block between 40th and 41st streets, and Eighth and Ninth avenues, would replace eight scattered bus terminals in mid-town, and would connect by overhead ramps with the Lincoln tunnel which handles 75 per cent of all buses entering Manhattan. Thirteen long and short haul bus operators have signed an agreement to cooperate with the Port Authority, nine have promised to sign soon, and six said the matter would be taken up with their directors.

the net reported during the 20-year period from 1921 to 1940, after consideration of possible offsets in reduced excess profits taxes.

Stressing the importance of adequate reserves in the retirement system, Dr. Parmelee said that "while the railroad retirement reserve is growing rapidly, the liabilities of the system are also growing rapidly, perhaps even more so than the reserve." In his opinion, "nothing should be permitted to interfere with or weaken" the reserve's "financial soundness." He regards it as particularly important that during its early years a retirement system of this sort "should not be radically changed until sufficient experience has been gained to supply a basis for changes."

"Cautious" on Latimer's Figures—As a result of experience with the Latimer estimates of 1937, Dr. Parmelee is "cautious" about accepting the R.R.B. chairman's "current estimates and calculations, some of which he admits are mere guesses, with respect to the future cost of the added burden now proposed to be loaded upon the railroad retirement system." The B.R.E. director then reviewed the actuarial advisory committee reports on the 1938 and 1941 valuations of the retirement fund. The latter found that the present tax should be increased from 6½ per cent of payroll to 10.45 per cent in order to support existing benefits. Mr. Latimer is contending that this deficiency will be taken care of by only 1½ per cent of the additional five per cent payroll tax which H. R. 1362 would impose.

The findings of the actuarial advisory committee were compared by Dr. Parmelee with the Latimer estimates of 1937, the B.R.E. director emphasizing that the "same danger" of underestimates underlies any endeavor to forecast future trends. As summarized by Dr. Parmelee, the Latimer estimates as to the added costs in H. R. 1362 total 5.90 per cent of payroll. The R.R.B. chairman then deducted 0.90 per cent as an estimated saving due to elimination of present lump-sum death benefits, and the proposed change in employment-relation provisions. Thus the latest Latimer estimate of net cost is 5 per cent, as compared with the 4.95 per cent he finally estimated with respect to H. R. 1362's predecessor last year.

While these two results are almost the same, Dr. Parmelee pointed out that the several steps by which they were reached varied widely, giving rise "to the thought that all these sets of estimates were pointed toward a tax increase of 5 per cent of the payroll, and they all succeeded in arriving at exactly that point." Among other things, Dr. Parmelee found no allowance in the Latimer estimates for the cost of lowering the permissible age of retirement for women employees from 65 to 60 years; nor for the cost of according prior service credits to red caps. Moreover, Mr. Latimer's estimates generally commit him "to a highly optimistic prediction" that future railroad payrolls will be about $3½ billion, "a level attained in only three years to date, being the highly stimulated war years 1943, 1944, and 1945."

Counts on a Big Payroll—In the latter connection Dr. Parmelee found that Mr. Latimer was in disagreement with the Retirement Board's director of research, "whose estimate for the year 1950 and each year on the average thereafter was only $2.29 billion." Thus, as the B.R.E. director put it, "Mr. Latimer can justify his estimate of the present tax deficiency, and all his other retirement cost estimates, only by predicting a much greater future payroll than his own staff, or the actuarial advisory committee, are willing to underwrite as even a 'plausible' assumption."

With respect to the increased cost of proposed amendments to the unemployment act, Dr. Parmelee found Mr. Latimer "less specific"—perhaps because in this set-up "the margin between income and outgo has grown appreciably." As Dr. Parmelee pointed out, the proposed amendments would not only add the sickness benefits on the same basis as unemployment benefits but would liberalize the latter by increasing the rate and lengthening the period of payment.

Giving examples of present unemployment benefits, the B.R.E. director noted that a man who now earns as little as $150 in railroad employment in 1945 can draw down a total of $175 in unemployment benefits in his benefit year beginning July 1, 1946. Under H. R. 1362, he would draw down $227.50, or $1.52 in benefits for each dollar received in wages. Mr. Latimer's estimates as to the cost of the additional benefits were "very general," being unsupported "by any specific data," according to Dr. Parmelee.

Sickness Benefits Are Expensive—In like fashion did the R.R.B. chairman put the cost of the proposed new sickness benefits at "slightly less than one per cent of payroll." Dr. Parmelee compared that estimate with the experience already had "with the only sickness benefit system now in effect in the United States, namely, that instituted by the State of Rhode Island in 1942, as part of its unemployment compensation system." The Rhode Island system, Dr. Parmelee emphasized, is financed by a tax of one per cent on the wages of employees up to $3,000 a year—the employer makes no contribution. He also noted other differences between the Rhode Island system and that proposed in H. R. 1362, all of which would tend to make the proposed railroad system more expensive.

Yet experience in Rhode Island "has already shown that sickness benefit costs, even on the very conservative basis there adopted, are greater than one per cent of payroll." During the first 10 months of 1944, the costs amounted to 1.16 per cent of payroll; and the director of the Rhode Island Unemployment Compensation Board "has already asked the state legislature to increase the sickness tax on employees from one to 1½ per cent." Thus Dr. Parmelee thinks it seems "highly optimistic to believe that the much more costly railroad system here proposed, and under the unemployment situation that will follow the war, can be financed on anything like a one per cent basis."

With respect to maternity cases qualifying for the proposed sickness benefits, Dr. Parmelee was inclined to question Mr. Latimer's estimate that the annual average would not be over 950 cases. The B.R.E. director pointed out that a woman employee may bear her child during employment; or may leave employment, get married, and if she becomes pregnant before her benefit year has expired she can begin to draw her maternity benefits and continue them into the next benefit year. He also noted that "single women may claim and receive maternity benefits, on exactly the same terms as married women."

Hard Times May Lie Ahead—Coming to his discussion of the unemployment insurance tax rate, Dr. Parmelee presented figures showing how collections have far outrun benefit payments to produce the present reserve of more than half a billion dollars. He urged the committee and the Congress to consider with respect to this tax something in the nature of the merit-rating plans applicable in connection with state unemployment insurance systems. Under such plans taxes are reduced when reserves reach specified levels. Only one of the 21 states represented by the 28 members of the committee lacks such a plan, Dr. Parmelee said. That state is New York, "where the matter is now under study." In the 20 other states, the merit-rating plans permit the unemployment taxes to be reduced to a range from nothing to 1.7 per cent of payroll. The railroads believe that they are entitled "to as much consideration, with respect to taxes of this nature, as has been accorded to employers generally throughout the country, and to employers in the District of Columbia by Congress itself."

In the latter part of his statement Dr. Parmelee looked over recent trends of railroad earnings and railroad prospects in the post-war period when competing agencies of transport "will resume and intensify their efforts to draw away railway traffic." In the latter connection he noted that "unfortunately for the railroads, even greater public aids for their competitors than before the war seems to be in prospect." Thus the B.R.E. director advised the committee that "every dictate of conservatism points to a policy of caution at this time." The next few years, he said, "should be devoted to stimulating railroad employment, not to developing additional burdens on railroad operations that will tend to discourage, rather than encourage, employment from reaching its highest possible levels."

Arbitration Award in S. P. Hospital Case

Control of the Southern Pacific's hospital system will be transferred to the employees under the unanimous report of a six-man arbitration board headed by Lief Erickson, former justice of the Supreme Court of Montana. Under the Railway Labor Act, awards of arbitration boards are binding on the parties, and this award becomes effective May 1.

As noted in the *Railway Age* of January 20, page 204, the S. P. and labor organizations representing its employees agreed to submit to arbitration certain employee requests with respect to the hospitals. The award provides for a new 13-member Board of Managers, the employees naming seven members and management the other six. It also calls upon the S. P. to assume the

hospitals' current deficit, and to pay half the cost of treating employees injured on the job. Among other provisions of the award is that extending the benefits of the hospital plan to employees of the certain S. P. affiliates not now covered.

Chairman Erickson was one of the two "neutral" members of the board, the other being Colonel Grady Lewis of Washington, D. C. The S. P. representatives were L. B. McDonald, operating vice-president, and J. G. Torian, manager of personnel; while the employees were represented by M. H. Barney, vice-president of the Order of Railway Conductors, and G. E. Leighty, vice-president of the Order of Railroad Telegraphers.

Railroad Advertising in Magazines and on the Radio

In a survey of advertising expenditures of leading advertisers, covering magazine and radio expenditures, but excluding newspapers, the Union Pacific has been reported to have led the railroads in the magnitude of its outlays for this purpose in 1944. The results of the survey are reported in "Printers' Ink", for which publication the study was made by Barbour Walker Lyndon, based on the copyrighted figures of Publishers' Information Bureau, Inc. The Union Pacific, it is reported, spent $765,128, of which $243,234 was for radio advertising. The study covers 601 advertisers, each of whom had a combined advertising outlay in magazines, farm papers and network radio during 1944 that totaled $100,000 or more. The railroads listed, together with the amounts reported as spent by them for the forementioned types of advertising were as follows:

Chicago, Milwaukee, St. Paul & Pacific	$144,540
Erie	139,540
New York Central	273,940
Northern Pacific	150,988
Pennsylvania	557,154
Santa Fe System	132,231
Southern Pacific	235,240
Union Pacific	765,128

The Association of American Railroads was listed as having spent $729,481; the Pullman Company, $532,520; and the Railway Express Agency, Inc., $307,217. The Union Pacific was the only railroad listed as having had expenditures on radio programs.

Vaughan Replies to Montreal's Mayor on Belt Line

In reply to Montreal's new mayor, Camillien Houde, who is reported to be opposing completion of the Bout de l'Isle 14.29-mi. belt line connecting C. N. R. facilities in the east end of the city with the railroad's main terminal facilities, the Canadian National's president, R. C. Vaughan, on March 10, declared the railroad had no intention of deviating from its policy of refraining from political controversy, but said again that the "line is urgently needed in the interests of efficient and economical transportation," and that to postpone construction would be "equivalent to a lack of foresight."

The C. N. R. chief recalled that a year ago Montreal's Executive committee had invited the report of the city engineering department. This group contended the belt line would benefit all sections of the city and would "provide undeniable advantages for the C. N. R., and permit them better to meet the needs of the Montreal district," Mr. Vaughan said.

When the builder's contract was awarded in April, 1944, President Vaughan then pointed out that the $2,870,000 project would improve the service given to industries in the eastern and western sections of the island, open new industrial sites to development, make possible the residential development of a large area in the northeast section of the island, and give passenger trains from Chicoutimi, Lake St. John and other north shore points direct access to the Central Station.

Mr. Vaughan now asserts that "to postpone this plan, which has been studied at length by the C. N. R. and approved, after investigation, by the Board of Transport Commissioners for Canada, the highest authority in all questions concerning railways, would be equivalent to a lack of foresight and would compromise progress of an important railway system as well as that of a great part of the city."

Mid-West Board Meeting Modified

In line with a request of the Office of Defense Transportation that all scheduled spring general meetings of advisory boards throughout the country be cancelled, the Mid-West Shippers Advisory Board last week announced that its proposed meeting, originally slated for April 5, has been modified. The announcement was made by General Chairman Irving M. Peters at Chicago, who declared that the meeting will consist only of members of the executive and railroad contact committees, and that there will be no general open meeting.

Veale Elected President of Pacific Railway Club

C. A. Veale, vice-president and general manager of the Northwestern Pacific, was elected president of the Pacific Railway Club at the 28th annual meeting of that organization, held in San Francisco, Cal., on March 8. Other officers elected were as follows:

W. T. Richardson, division engineer of the Western Pacific, vice-president; H. E. Jordan, superintendent of equipment of the Los Angeles Transit Lines, vice-president; H. R. Fegley, assistant to the general manager, Western Pacific, vice-president, and George C. Fish, superintendent, Union Pacific, vice-president. William S. Wollner was re-elected executive secretary of the club.

Credit Union Membership on N. Y. C. Grows

The New York Central recently looked into the Credit Union movement on the System, and discovered that in the past two years its 26 credit unions have become 30, its assets have jumped from $1,869,627 to $3,045,774, and that its membership has showed nearly a 10,000 gain over the 23,967 total in 1942.

Total loans outstanding, the railroad found, amounted to $1,648,916 compared with $1,082,632 at the last count. Indicative of the satisfactory results being obtained are the accounting department records which point to 815 wage assignments or garnishee attachments against employees in 1942, but only 314 at the close of 1944.

According to L. W. Horning, vice-president, personnel, "the growth of the Credit Union movement and the results achieved, notwithstanding restrictions imposed during the war, are ample testimony to the rewards of cooperation and team work among employees."

Car Research Conference at Purdue

Thirty-four representatives of railway material suppliers, the Association of American Railroads, the American Railway Car Institute and Purdue University met, at the invitation of Dean A. A. Potter, on March 7, 1945, at Lafayette, Ind., to discuss a program of research intended to furnish factual data useful in the design of modern railway cars. The discussions at this conference brought out the importance of utilizing recent developments in instrumentation and techniques to secure an accurate picture of the factors essential for the most effective utilization of different materials in modern freight car design, and of the desirability of tests on complete cars. It is expected that this conference will result in a research program of special interest to the railroads as well as to those who supply railway car materials.

O. D. T. Allotted Half the Tires Asked for Second Quarter

Allocations of heavy-duty tires for commercial motor vehicles in the second quarter of 1945 are only 50.7 per cent of the request submitted to the War Production Board by the Office of Defense Transportation as claimant agency for civilian transportation, according to O. D. T. Director J. Monroe Johnson.

The number allocated will restrict distribution to a rate of 156,000 tires per month in the larger sizes (over 8.25 by 20) and 314,000 per month in the smaller sizes, he said. While these allotments exceed those provided for the first quarter of the year, there is no basis for optimism in that fact, he pointed out, inasmuch as the increase reflects the greater need for tires in hot weather.

Representation of Employees

Winning two recent elections over the challenging Brotherhood of Railroad Trainmen, the Order of Railway Conductors has retained the right to represent road conductors of the Chicago & North Western and Bessemer & Lake Erie. Passing on results of the elections, the National Mediation Board has certified that no change in representation was desired in either case.

As a result of another recent election, the B. of R. T. has been displaced, temporarily at least, as representative of yardmasters employed by the State Belt of California. On the basis of the report of the election, in which the Railroad Yardmasters of America was the B. of R. T. opponent, the board found itself unable to make a certification "for the reason that no organization or individual received a majority of the legal votes cast."

The International Brotherhood of Blacksmiths, Drop Forgers & Helpers, operating

through the Railway Employees Department, American Federation of Labor, has supplanted the Federated Shop Crafts of the Bessemer & Lake Erie Railroad as representative of B. & L. E. blacksmiths, their helpers and apprentices. The Railway Employees Department, A. F. of L., System Federation No. 96, has won the right to represent the previously unrepresented Lehigh Valley mechanical department foremen and supervisors of mechanics (including foremen in the telegraph and telephone department). On the Seaboard Air Line, the Brotherhood of Railroad Signalmen of America has extended its coverage of signal department employees to the entire group, including signal foremen.

January Accident Statistics

The Interstate Commerce Commission on March 14 made public its Bureau of Transport Economics and Statistics' preliminary summary of steam railway accidents for January, compared with January, 1944. The compilation, which is subject to revision, follows:

Item	Month of January 1945	1944
Number of train accidents*	1,654	1,402
Number of casualties in train, train-service and nontrain accidents:		
Trespassers:		
Killed	95	102
Injured	90	68
Passengers on trains:		
(a) In train accidents*		
Killed	..	7
Injured	60	182
(b) In train-service accidents		
Killed	6	4
Injured	252	200
Travelers not on trains:		
Killed	..	1
Injured	136	92
Employees on duty:		
Killed	95	90
Injured	4,266	3,875
All other nontrespassers:**		
Killed	191	207
Injured	882	786
Total—All classes of persons:		
Killed	387	411
Injured	5,686	5,203

* Train accidents (mostly collisions and derailments) are distinguished from train-service accidents by the fact that the former cause damage of more than $150 to railway property.

** Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers,* were as follows:

Persons:		
Killed	174	191
Injured	582	521

Little Prejudice Against Negro Enginemen, Survey Finds

According to a recent nation-wide survey, conducted by the National Opinion Research Center, University of Denver, 72 per cent of the white people in the United States believe that negroes qualified to be railroad enginemen should be given a chance at the job. Five per cent of those interviewed were undecided, 3 per cent said "it depends," and 20 per cent flatly said "no."

The survey was said to have been suggested by a recent Supreme Court decision denying to one of the engine service unions the right to enforce contracts discriminating against negro engineers and firemen. The Opnion Research Center found that the more schooling a person had, the more likely he was to agree with the Supreme Court.

In the "it depends" group, replies indicated a negro should be given a chance if firemen and train crew were also negroes, if liquor were banned, if no white engineer were available, or if limited to sections where there was no race prejudice.

The "no" group implied negroes as being incapable of "quick judgment, not dependable in emergencies . . . too excitable."

February Export Freight

Export freight, excluding coal and grain, handled through United States ports in February totaled 165,410 cars, compared with 127,089 cars in the same month last year, or an increase of 31 per cent, according to the Association of American Railroads.

Export grain unloaded at the ports totaled 4,122 cars, compared with 3,373 in February, 1944, or an increase of 22 per cent. Railroads handled 343 carloads of coastal freight in February, compared with 1,232 in the same month in 1944, or a decrease of 72 per cent.

The total of 169,875 cars of export and coastal freight, excluding coal, handled through the ports in February this year represented an average daily unloading of 6,067 cars, the highest on record. The previous high was 5,872 cars established in January this year.

February Employment 1.88 Per Cent Above Previous Year

Railroad employment increased 1.59 per cent—from 1,390,718 to 1,412,890—during the one-month period from mid-January to mid-February, and the February total was 1.88 per cent above that of February, 1944, according to the preliminary summary based on reports from Class I line haul roads and prepared by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. The index number, based on the 1935-1939 average, was 141.9, as compared with 141.7 for the previous month and 139.3 for February, 1944.

February, 1945, employment was above that of the corresponding 1944 month in all groups except train and engine service, in which the decrease was 0.06 per cent. In other categories the range of increases was from 0.96 per cent for maintenance of equipment and stores to 4.77 per cent for maintenance of way and structures. In the comparison with the previous month, the only decrease noted was that of 0.74 per cent in the yardmasters, switch-tenders and hostlers transportation group. In the other categories the range of increases was from 0.35 per cent for executives, officials and staff assistants to 4.16 per cent for maintenance of way and structures.

New York Central Gets Its First 4-8-4 Type Locomotive

The first locomotive of the 4-8-4 type to be built for the New York Central was delivered to the railroad on Saturday, March 10, at the Schenectady, N. Y., plant of the American Locomotive Company in a ceremony witnessed by the employees of the plant and other guests. After the locomotive rolled out of the shop under its own steam, the employees were addressed by Governor Thomas E. Dewey who later made a tour of inspection of the plant.

The locomotive, known on the railroad as the Niagara type, was formally delivered by Duncan Fraser, president of the American Locomotive Company, and accepted by Gustav Metzman, president of the New York Central System. It has driving wheels 75 in. in diameter which carry 275,000 lb. The cylinders are 25 in. in diameter by 32 in. stroke. With a boiler pressure of 275 lb., the maximum tractive force is 62,500 lb. The total weight of the locomotive and tender, with the latter two-

New York's Governor Dewey Inspects the New Locomotive

thirds loaded, is 808,400 lb. The tender has a capacity for 46 tons of coal and 18,000 gals. of water.

In accepting the locomotive Mr. Metzman pointed out that the New York Central has ordered 25 additional locomotives of the same general design in which may be incorporated modifications indicated by exhaustive performance tests which will be made on the new locomotive. Following tests with the 75-in. driving wheels, the performance with 79-in. drivers will be studied. With these wheels the boiler pressure will be raised to 290 lb.

Governor Dewey in his address congratulated the American Locomotive Company employees and management on the fact that collective bargaining had progressed peacefully and harmoniously without a major strike since the beginning of the war.

Would Remove Carrier Pacts from Antitrust Laws

Representative Bulwinkle, Democrat of North Carolina, has introduced H.R. 2536 to stay the operation of the antitrust laws with respect to agreements between carriers, which have been approved by the Interstate Commerce Commission. The bill is drawn in broader terms than H.R. 167, previously introduced by Mr. Bulwinkle, to grant relief with respect to operations of carrier rate bureaus. While applying to rate bureaus, the new bill also covers other types of carrier agreements.

Specifically excepted, however, are agreements with respect to pooling, division, consolidation, merger, purchase, lease, acquisition, "or other transaction to which section 5 is applicable." Any carrier, party to an agreement other than the foregoing, would be authorized to apply to the I. C. C. for approval of such agreement. If the commission found that the agreement would further the national transportation policy, it could relieve the parties from the operation of the antitrust laws.

With the introduction of the bill Mr. Bulwinkle issued a statement saying that the measure "has for its purpose the removal of a great part of the uncertainty and confusion which has hampered, and which will hamper, the railroads to a great extent if this or some similar bill is not passed."

"For fifty years or more," he added, "the Interstate Commerce Commission, one government agency which has enjoyed the confidence of the people of the country, has been regulating the railroads so as to insure reasonable and non-discriminatory rates and fair practices. The Interstate Commerce Commission was set up as, and is, the arm of the Congress for the purpose of insuring reasonable and non-discriminatory rates and fair practices, and the Congress has relied upon the Interstate Commerce Commission for these many years.

"In recent years, and especially at the present time, there is uncertainty and confusion concerning the application of the antitrust laws to railroads and other surface carriers. This situation has brought about a condition which requires and demands an immediate, common-sense remedy. It is a matter of general knowledge that the carriers can not serve two masters; therefore, it becomes the duty of the Congress to say which government agency, or department, shall have control of the regulation of the railroads and other carriers.

"The bill . . . makes it entirely clear that the antitrust laws are to be applied to common carriers in a way which will not prevent or obstruct the carrying out of the will of Congress, as contained in the Transportation Act of 1940. Care has been taken in drafting the bill to guard the public interest in accordance with the provisions of the National Transportation Policy. The treatment which the bill gives surface carriers is similar to that now given to air carriers under the Civil Aeronautics Act."

C. E. Johnston, chairman of the Western Association of Railway Executives, Chicago, last week went on record as saying that enactment of the proposed amendment to the Interstate Commerce Act "would afford much-needed assurance that the country's transportation system will not be wrecked by the Anti-Trust division of the Department of Justice." Declaring that the intent of Congress with respect to the authority delegated to the Interstate Commerce Commission should be clarified beyond any misunderstanding, and that the nation could not tolerate "the confusion which would result if the Anti-Trust division succeeded in substituting its theories for the policies developed by Congress over a period of half a century," Mr. Johnston added:

"The railroads have complied with both the letter and spirit of the Interstate Commerce Act. They have cooperated to achieve the ends set forth in the Congressional declaration of transportation policy, and they have meticulously obeyed the mandates of the Interstate Commerce Commission."

Telling Employees What Their Road's Reputation Is

The Canadian National through its employees' magazine has begun making known to its employees what leading newspapers and magazines are saying about the C. N. R. and its affiliated services. In the February issue of the C. N. R. magazine a double-page spread of such quotations was published (23 newspapers quoted). In the March issue 21 additional editorial expressions were printed.

I. C. C. Makes Seatrain Take "Corrected" Certificate

Over the protest of three dissenting commissioners, the Interstate Commerce Commission has deprived Seatrain Lines, Inc., of its water-carrier certificate authorizing the transportation of "commodities generally," and has issued a "corrected" certificate restricting operations to the transportation of liquid cargoes in bulk, and "of empty railroad cars, and of property loaded in railroad cars received from and delivered to rail carriers, and transported without transfer from the railroad cars."

The report on reconsideration in the No. W-543 proceeding follows the commission's recent action affirming Division 4's finding that "freight car ferry service is a special kind of transportation not embraced within the term 'transportation of commodities generally' by water." Division 4's finding was in No. W-587, Foss Launch & Tug Co. Applications, and the commission's affirmation of that finding came in its report on reconsideration, noted in the *Railway Age* of January 6, page 125.

Seatrain is not now in operation, its vessels having been taken over by the government; but prior to the war these seagoing car ferries operated between New York and New Orleans, La., and Texas City, Tex., via Havana, Cuba. Seatrain's certificate was awarded in Division 4's report of July 2, 1942; and Seatrain contended that in the absence of a showing of fraud or misrepresentation with respect to the original certificate, the commission was without power at this time to limit, restrict, or withdraw that certificate.

Much of the majority report is a discussion of the "questions of law" involved, and argument in support of the majority view that the commission does have power to "correct" a certificate. Among such arguments was one to the effect that certificates of public convenience and necessity amount to orders of the commission; and the commission "has complete control over its orders," retaining the right to suspend, modify, or set them aside. Also it is noted that the Seatrain certificate itself provided that it was subject "to such terms, conditions, and limitations as are now, or may hereafter be, attached to the exercise of such authority by this commission." Thus did the commission find "ample power to correct a certificate, in the public interest, as we may find appropriate, when through inadvertence greater authority was granted than the facts warrant."

The majority report was by Commissioner Porter. Commissioner Splawn, concurring, agreed with the majority view that the commission may correct a certificate that has been issued inadvertently. He did not agree "with the implication of the report that the commission may at any time for any cause change an outstanding certificate."

Dissenters' Views—Commissioner Lee, in a lengthy dissent, took the position that the original Seatrain certificate was not issued "through inadvertence," for the present proceedings arose because Division 4 changed its mind with respect to such certificate.

He thus found the commission without power to amend or revoke the certificate without Seatrain's consent. "A certificate," said Mr. Lee, "is something more than a mere revocable license. It is similar to a franchise."

Other dissents came from Commissioners Alldredge and Patterson. The former disagreed with the majority, "primarily on grounds of what I consider to be sound administrative policy rather than upon technical legal principles." He does not think a certificate is "immune to modification," but he does think it is something more than an order "which can be modified or set aside like any other order." Mr. Alldredge would move cautiously against certificates lest elements of uncertainty and instability be introduced into the regulated water-carrier industry. He notes that the present action was taken after the certificate had been in effect for more than two and one-half years; and that it was taken on the commission's own initiative, with no in-

terested party questioning the propriety of the certificate.

Commissioner Patterson expressed his doubt that the commission had authority to restrict the certificate, and he also recalled his separate expression in the Foss case where he regarded as unwarranted the conditioning of a certificate "upon the transportation of traffic in a freight car or any other specified type of container."

Commissioner Aitchison did not participate in the decision.

Wallace Unaware of Any Official Move to Shift I. C. C.

Secretary of Commerce Wallace knows nothing except what he reads in the newspapers about proposals to merge various agencies, including the Interstate Commerce Commission, into the Department of Commerce. The secretary made that response to a question at his March 12 press conference.

Talk of further consolidation of government agencies has been revived in Washington recently by newspaper articles, particularly one which had it that work was going on in the Bureau of the Budget on an Executive Order whereby such agencies as the I. C. C., Federal Trade Commission, Federal Power Commission, and Securities and Exchange Commission would be transferred to Commerce.

Following publication of the article, it was stated at the Bureau of the Budget that there was "nothing" to the report. Shippers and Congressional leaders, such as Chairman Wheeler of the Senate committee on interstate commerce and Chairman Lea of the House committee on interstate and foreign commerce, may be expected to oppose, as they have in the past, any move to place the I. C. C. in the executive department of the government.

I. C. C. Service Orders

In view of interruptions to service resulting from flood conditions on the Ohio river and its tributaries, the Interstate Commerce Commission has issued Service Order No. 290, effective from March 8 through March 31, unless otherwise ordered, directing railroads affected to reroute traffic by the most available open routes without regard to shipper's routing.

Supplementing prevailing orders restricting the use of refrigerator cars, and directing the use of ventilated box cars, in the movement of citrus fruit from Florida to points on or south of a line from New York through Philadelphia, Pa., Pittsburgh, Columbus, Ohio, Indianapolis, Ind., and St. Louis, Mo., the commission has issued Service Order No. 292, effective March 14 through April 30, unless otherwise ordered, providing that type RS refrigerator cars loaded with citrus fruits destined to points north of that line shall not be stopped for partial unloading at any point south of the line unless at least 50 per cent of the original lading is forwarded to final destination north of the line. The order was issued, it was indicated, to prevent evasion of the restrictions and dislocation of the supply of such cars through the practice of removing most of the lading at points south of the line by stop-off for partial unloading of cars consigned to points north of it.

The seasonal order of the Car Service Division of the Association of American Railroads directing prompt return empty of ventilated box cars to southeastern roads, and limiting their loading to perishable freight in that territory, noted in *Railway Age* March 10, page 458, has been modified by the omission of the Central of Georgia from the list of roads to whose cars the order applies.

The suspension of penalty demurrage charges on refrigerator cars prescribed under Revised Service Order No. 180, which was authorized during periods of extreme weather under Amendment No. 1 to that order, has been extended to situations where high water or flood conditions prevent placing cars at the usual points of delivery. This modification was effected by Amendment No. 2 to the order, canceling Amendment No. 1, its effective date being March 8 and its expiration date, unless otherwise ordered, December 1.

Restrictions on the reconsignment and diversion of carload shipments of hay have been prescribed by Service Order No. 293, effective March 16 through August 1 unless otherwise ordered. The order provides that such cars may not be reconsigned or diverted more than two times before arrival at destination, or have at destination more than one change in place of unloading or name of consignee or consignor, except that a change in name of consignee or consignor en route, without a change in the routing or destination of the car, will not be considered a diversion or reconsignment within the meaning of the order.

The A. A. R. Car Service Division has directed all railroads to decline to place open top cars (gondolas or hoppers) for loading with corn, wheat, or other grains, inasmuch as local deficiencies are occurring daily in the supply of such cars for loading with coal at the mines, handling ore, military freight, iron and steel, and other essential uses.

Ohio Valley Authority Bill

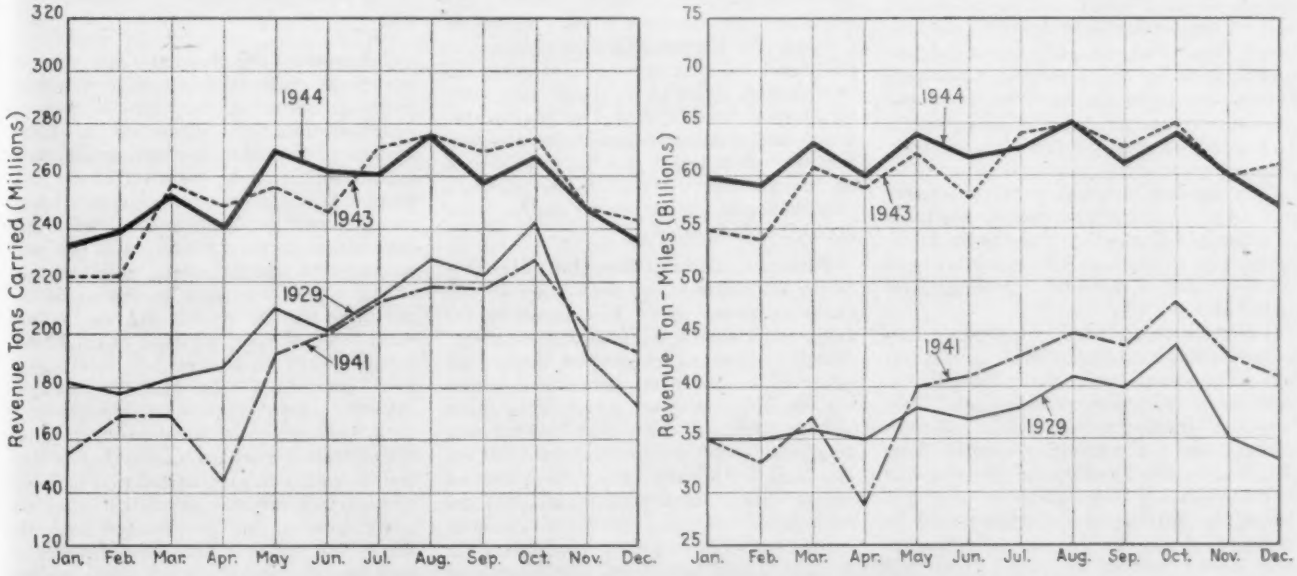
Representative Bender, Republican of Ohio, has introduced H. R. 2540 to establish an Ohio Valley Authority "to provide for unified water control and resource development on the Ohio river and surrounding region."

O. D. T. Appointment

Appointment of Victor Parvin to succeed John M. Fush as district port director at New Orleans, La., in the Railway Transport Department of the Office of Defense Transportation, effective March 1, has been announced. Mr. Parvin was general superintendent of the Ann Arbor before joining the O. D. T. in December, 1943, as district railroad director in the Railway Transport Department at Birmingham, Ala.

Freight Car Loading

Loadings of revenue freight for the week ended March 10 totaled 766,290 cars, the Association of American Railroads announced on March 15. This was a decrease of 18,974 cars or 2.4 per cent under the preceding week, a decrease of 13,975 cars or 1.8 per cent below the corresponding



Revenue Tons and Revenue Ton-Miles—1944 Compared with 1929, 1941 and 1943

week last year, and a decrease of 2,755 cars or 0.4 per cent below the comparable 1943 week.

Loading of revenue freight for the week ended March 3 totaled 785,264 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, March 3

District	1945	1944	1943
Eastern	158,858	159,498	151,336
Allegheny	172,571	174,962	163,832
Pocahontas	52,091	52,699	56,746
Southern	127,838	124,148	116,488
Northwestern	81,493	86,982	80,807
Central Western	122,848	118,644	113,969
Southwestern	69,565	69,960	65,748
Total Western Districts	273,906	275,586	260,524
Total All Roads	785,264	786,893	748,926
Commodities			
Grain and grain products	41,380	48,281	50,440
Live stock	13,995	15,059	12,850
Coal	162,693	171,127	174,617
Coke	15,312	14,883	15,221
Forest products	41,069	43,180	39,499
Ore	14,394	13,475	13,024
Merchandise l.c.l.	107,030	104,911	93,729
Miscellaneous	389,391	375,977	349,546
March 3	785,264	786,893	748,926
February 24	771,843	780,984	782,921
February 17	783,738	774,237	752,019
February 10	755,436	793,181	765,271
February 3	738,680	805,714	755,514
Cumulative Total, 9 Weeks	6,836,505	7,099,709	6,715,289

In Canada.—Carloadings for the week ended March 3 totaled 67,468, as compared with 66,364 for the previous week, and 69,207 for the corresponding period last year, according to the compilation of the Dominion Bureau of Statistics.

Total for Canada:	Total Cars Loaded	Total Cars Rec'd from Connections
Mar. 3, 1945	67,468	40,494
Mar. 4, 1944	69,207	42,517
Cumulative Totals for Canada:		
Mar. 3, 1945	576,992	319,494
Mar. 4, 1944	607,600	351,544

Report on Rear Collision Near Great Salt Lake

The rear-end collision on the Southern Pacific near Bagley, Utah, on December 31, 1944, in which 41 passengers and 9 employees were killed and 66 passengers and 15 employees were injured, was the result, according to the report of the investigation by the Interstate Commerce Commission under the supervision of Commissioner Patterson, of "failure properly to control the speed of the following train in accordance with signal indications."

This accident occurred in foggy weather at 5:14 a. m. on level, tangent, double track at a point 18.82 miles west of Ogden, Utah, on the line to Oakland, Calif., not far from the beginning of the trestle crossing Great Salt Lake.

Train operations were by timetable, train orders, and an automatic block signal system. The signals were of the two-position semaphore type, approach lighted. They were not arranged to display approach indications, but the controlling circuits were designed to provide adequate stopping distance by causing stop indications to be displayed by two signals to the rear of an occupied block. Trains were required to stop upon observing such indications, and then could proceed at not to exceed 12 m. p. h., prepared to stop short of a train or obstruction, repeating this procedure at each signal displaying stop.

The trains involved were two sections of No. 21, the westbound "Pacific Limited." The first section included 5 head-end cars, 2 Army hospital cars, 7 coaches, 1 diner, 1 Pullman tourist car and 2 Pullman sleeping cars, in that order. As this train approached Bagley, stop signals were observed; it proceeded under control and was moving about 8 m. p. h., preparing to stop in response to signals given by the flagman of a preceding freight, when the collision occurred.

Engineer Died Before Collision—The second section, which left Ogden 12 min. after the first, was made up of 19 mail, express and baggage cars and one coach. The two signals immediately east of the first section, which were 8,146 ft. and 2,458 ft., respectively, east of the point of the accident, were functioning properly as the first section passed them and after the accident occurred. The fireman of the second section did not observe the indication of the more easterly of these signals, but he did observe and call a stop indication at the second signal. No action to reduce speed was then taken, but the crew of the second section noticed a brake application about 12 sec. before the collision occurred. This effected a reduction in speed from about 65 m. p. h. to about 50 m. p. h. before the engine of the second section struck the rear of the first section.

A lighted fusee was found on the track about 1,000 ft. east of the point of the accident, and another in the immediate vicinity. The flagman of the first section was fatally injured. The engineer of the second section was found dead after the accident, and a coroner's jury's verdict was to the effect that he came to his death "by sudden shock or heart failure just before the occurrence of the impact between the two trains." If the engineer became incapacitated before the accident, said the commission's report, this probably happened after the brake application just noted.

The thirteenth car of the first section telescoped the twelfth car about 45 ft. (both were coaches); the sixteenth (tourist) car telescoped the fifteenth (diner) about 40 ft.; and the engine of the second section telescoped the rear car (Pullman) of the first section about 13 ft. These cars were all of steel construction. The twelfth, fifteenth and eighteenth cars of the first section were demolished and the front end of the engine and the first to the eleventh cars, inclusive, of the second section were derailed and damaged.

Fireman Didn't See 1st Signal—When the engineer of the second section failed to control speed as required by the rules when that train passed the easterly signal protecting the occupied block, "the safety of the movement thereafter depended entirely upon necessary action being taken by the fireman," the report pointed out, "but in this case the fireman could not see this signal" (because of fog) and did not realize there was a train ahead until the next signal was observed. "If a cab-signal system had been in use," it continued, "the fireman would have been able to observe all signal indications, and he would have realized that the circumstances required him to take necessary action to control the speed properly.

"An automatic train-stop or train control system is designed to enforce the requirements of automatic block signal indications when the engineer fails because of disability or any other reason to take necessary action to control the speed of the train," the commission's report then observed. "If an adequate automatic train-stop or train control system had been in use in this territory, an automatic application of the brakes sufficient to cause Second 21 to stop short of First 21 would have occurred, and this accident would have been averted."

I.C.C. Can Take Notice of Its Own Decisions

(*Continued from page 517*)

lieve that we are entitled to take notice of those conclusions in cases arising thereafter, and until, upon further broad investigation, such conclusions are shown to be wrong. Obviously it is impracticable and unnecessary to undertake a widespread and expensive investigation in each and every case that comes before us or to require a complaining party to do so. Such a requirement would be wholly incompatible with efficient administration and would be tantamount to a denial of the remedy which the law purports to hold out to the small claimant before us."

In the remainder of the report the commission looks over court interpretations of the rule respecting the taking of official notice by administrative agencies, thus finding support for its own view of the matter. It leads up to its affirmation of Division 3's conclusions with a finding "that transportation and traffic conditions incident to shipments of scrap iron and steel from and to points involved in the instant complaints are substantially similar to those in the proceedings above cited, in which we have prescribed the 70-per cent basis, and that those conditions, together with the evidence introduced by the parties, justify the prescription of rates on the same basis here."

Johnson's Vote Needed—The majority report was adopted only after Commissioner Johnson, director of the Office of Defense Transportation, had voted for it. Commissioner Mahaffie, concurring in part, agreed with what he regarded as the "important features" of the majority report, i.e., the findings that the commission had jurisdiction further to consider the proceeding and that it might properly take official notice of its own decisions. He did not agree that the record, plus the findings made in other cases, afforded "a valid basis for an award of damages." Commissioner Lee subscribed to these Mahaffie views.

Commissioner Patterson, concurring in part, took much the same position; while Commissioner Barnard, concurring in part and dissenting in part, agreed that the commission had further jurisdiction after the court decision, but he dissented from the view "that we may take official notice of our own decisions." In the latter connection, Mr. Barnard developed his argument

at some length, and he also disagreed with the findings that the rates were unreasonable and that the complainant was entitled to reparation.

Commissioner Miller, dissenting, found evidence that the rates were not unreasonable, yet the majority report gave such evidence "little or no weight," while it condemned the rates "simply because they exceeded or exceed the so-called 70-per cent basis." Moreover, he regards as "plainly arbitrary," the "continuous gradual extension of this so-called 70-per cent basis throughout Official Territory without an investigation wherein all interests would be given an opportunity to be heard."

Johnson Objects to 5-Day Week in Produce Markets

Operation of produce markets on a 5-day instead of a 6-day week basis was condemned in a March 10 statement by Director Johnson of the Office of Defense Transportation, who termed such practices "wasteful of the country's critically limited supply of refrigerator cars."

Signing of a new union contract calling for 5-day week operations the year 'round in the wholesale produce market at New York was the occasion for a letter from Col. Johnson to Mayor LaGuardia of that city, in which the O. D. T. head pointed out that it will be necessary for the O. D. T. to reduce the number of cars going to New York as a result. In another letter to the Chicago Market Association, referring to similar action contemplated there, Col. Johnson emphasized the lack of sufficient refrigerator cars to permit the delays resulting from 5-day week operation. If the market is going to operate on that basis, he said, it will be permitted to have only five-sixths as many cars as it would receive if working on a 6-day basis.

Chicago Union Station Opens New "Infant Lounge"

As a means of offering every available aid to mothers of infants who are forced to spend many hours in Chicago between trains, the Chicago Union Station Company has established a new nursery under the name of the Infant's Lounge. Operated under the supervision of O. H. Frick, general manager of the station, the lounge is equipped with indirect lighting, leather-upholstered chairs, baby cribs, costumers, cots for adults, clock, drinking fountain, private dressing rooms and bath rooms as well as electrical equipment for heating infant food. These new facilities are available to patrons of the Alton, the Chicago, Burlington & Quincy, the Chicago, Milwaukee, St. Paul & Pacific and the Pennsylvania.

Club Meetings

The Northwest Locomotive Association will meet at 8 p. m., March 19, at Woodruff Hall, St. Paul, Minn. J. A. Partington, manager of the engineering department, American Locomotive Company, will address the group on "Locomotive Boilers—Welded Construction."

A luncheon benefit for the Red Cross will be held by the Traffic Club of New York, March 22, at 12:30 p.m., in the Grand Ballroom of the Hotel Biltmore. Guest speaker will be Henderson E. Van Surdan of the American Red Cross.

The Northwest Car Men's Association will meet at 8 p.m., April 2, in the Midway Club Room, 1931 University Avenue, St. Paul, Minn. W. L. Harvey, district manager of the Association of American Railroads, will present a paper on "General Transportation Conditions and Car Supply."

The Car Department Association of St. Louis will meet at 8 p.m. March 20, at the Hotel DeSoto, and will hear a discussion of the past and future uses of aluminum, by Dr. Paul V. Faragher, of the Aluminum Company of America. A motion picture, entitled "Mine to Metal" also is to be shown.

"Coordinated Transportation in New England" is the title of an address to be given by F. J. Wall, vice-president, New York, New Haven & Hartford, at the April 10, 6:30 p.m. meeting of the New England Railroad Club, at Hotel Vendome, Boston.

Avila Gives Mexican Railways New Administrative Set-Up

President Avila Camacho of Mexico has announced a new administrative set-up for the National Railways of Mexico which in part is a modification of a similar decree issued on March 9, 1944. The new order has been worked out, it was said, as a means of developing a better method of meeting the prevailing emergency.

Under the new order the administration of the National Railways of Mexico is placed in charge of a general manager, whose appointment is in the hands of President of the Republic, and an administrative board composed of 10 members as follows: One by the under-secretary of finance and public credit, who will be president of the board; one by each of the under-secretaries of communications and public works, agriculture, national economy, labor, and the Confederation of National Chambers of Commerce and Industry, two by the Union of Railroad Workers, one by the Confederation of Chambers of industry, and one by the general manager.

Equipment and Supplies

LOCOMOTIVES

The board of directors of the NATIONAL RAILWAYS OF MEXICO has approved the purchase of $20,000,000 of new equipment. Included are locomotives, freight and passenger cars, which are to be purchased in the United States as rapidly as manufacturers can arrange construction and delivery.

The GREAT NORTHERN has placed an order with the Electro-Motive division of the General Motors Corporation for six 2,700-hp. freight locomotives, six 1,000-hp. switchers and three 1,350-hp. A units for delivery this year, and for ten 1,000-hp. road and switching locomotives for delivery during the first quarter of 1946.

FREIGHT CARS

The ARGENTINE STATE RAILWAYS has issued new inquiries for 600 35-ton box cars, 100 35-ton cattle cars and 300 35-ton flat cars.

The CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is reported to have ordered 1,000 box cars of 50 tons' capacity from the railroad's own shops.

The NATIONAL RAILWAYS OF MEXICO has ordered 1,500 box cars of 50 tons' capacity for delivery this year from the American Car & Foundry Co. The cars will be built at the company's St. Louis, Mo., plant.

Supply Trade

The **Copperweld Steel Company**, Glassport, Pa., has announced the resignation of **Robert B. Craig**, who has been connected with the export division.

M. E. Miller has been promoted from district representative to central sales manager, with offices in Peoria, Ill., for **R. G. LeTourneau, Inc.**

Carl R. Moline, chief engineer of the **Allied Railway Equipment Company**, Chicago, has been elected vice-president, with headquarters at Chicago. He will continue as chief engineer.

J. A. Cronk has been appointed manager of the Atlanta, Ga., branch of the **Electric Storage Battery Company**, Philadelphia, Pa., to succeed **Mark C. Pope, Jr.**, whose appointment as a district sales manager of the ACF-Brill Motors Company is reported elsewhere in these pages.

W. O. Robertson, assistant manage of the construction division of Armco Drainage & Metal Products, Inc., has been appointed manager of the Philadelphia, Pa., district of the **Armco Railroad Sales Company. James L. Turvey** has been transferred from the company's home offices to the New York office of the Armco Railroad Sales Company as a salesman.

Mark C. Pope has been appointed district sales manager, southeastern district, of the **ACF-Brill Motors Company** with offices at Atlanta, Ga. He will cover the states of Florida, Georgia, North Carolina, South Carolina, Alabama and eastern Tennessee in the sale of ACF-Brill Transit Vehicles. Since 1925 and until his new association, Mr. Pope managed the Atlanta branch of the Electric Storage Battery Company.

The **Briggs Clarifier Company**, Washington, D. C., has announced the following expansion of its sales activities. The **Manning Packing & Supply Co.**, Portland, Ore., has been appointed to handle distribution of Briggs Oil Clarifiers in Oregon and the southern parts of Washington and the **Hendrie and Bolthoff Manufacturing & Supply Co.**, Denver, Col., has been appointed to handle distribution in the states of Wyoming, Colorado, New Mexico and western Nebraska. Dis-

tribution in the state of Oklahoma will be handled by the **M. F. Hampton Company,** Tulsa, Okla., and in northern Texas, Briggs products will be distributed by the **Hoffman Supply Company,** Abilene, Tex.

John J. Healy, who has been with the Army air forces for the past 33 months and holds the rank of captain, has been assigned to inactive duty and has returned to the **Copperweld Steel Company** as northwest representative. He will serve under the jurisdiction of Copperweld's Chicago office and will cover the states of Minnesota, North and South Dakota, Montana, the upper peninsula of Michigan and the northern portion of Wisconsin—the territory he covered prior to his enlistment.

The following changes have been announced in the railway sales division of the **Texas Company: J. M. P. McCraven,** from district manager at Chicago to assistant manager at New York; **John B. Flynn,** from district manager to assistant manager at New York; **A. W. Larsen,** from assistant district manager at St. Louis, Mo., to district manager at Chicago; **C. H. Weisel,** from assistant district manager to district manager at New York; **R. W. Woods,** from representative to assistant district manager at New York; and **W. E. Wilcox,** from lubrication engineer, at Roanoke, Va., to assistant district manager at St. Louis.

W. R. Persons has been appointed assistant sales manager of the **Lincoln Electric Company,** Cleveland, Ohio. Mr. Persons has been with the company for the past ten years. He was graduated from the Case School of Applied Science. He took the Lincoln Electric Company's welding course and subsequently was assigned to the position of sales and service representative in western Pennsylvania. He was appointed branch manager of the company's Pittsburgh, Pa., office four years later, continuing at this post until his transfer to the home office at Cleveland last year, where he has been working on special assignments. He is chairman of the company's junior board of directors.

In his annual report for the year 1944, J. F. MacEnulty, president of the **Pressed Steel Car Company,** has informed the stockholders that the company is still actively investigating the possibilities of manufacturing products other than cars in the post-war period and is also continuing the design and planning of new developments in passenger and freight cars. Mr. MacEnulty said the company's export department also was very active in its expansion efforts and that during recent months orders have been received for 2,100 freight cars through South American representatives. Prior to the occupation of Japan, he added, the company's Philippine affiliate was very prosperous and it is expected that operations will be renewed there as soon as possible as well as in other advantageous foreign markets.

In 1944, gross profit before provision for depreciation amounted to $10,815,005. Net profit transferred to surplus amounted to $1,847,585, which was somewhat less than that reported for the year 1943, due largely to the reduction in the fixed-fees on government contracts for combat vehicles manufactured at the Hegewisch, Ill., plant. More units were shipped in 1944 than in 1943 but, through efficiency in manufacturing operations, the company was able to materially reduce the costs of units produced, resulting sizable reductions in fixed-fees. The company was reported to have a substantial backlog of freight cars for manufacture at its McKees Rocks, Pa., plant including cars purchased for governmental agencies for war necessities and lend-lease.

Richard A. Rowland has been elected vice-president of the **Gould Storage Battery Corporation,** (the Gould Industrial division of the **National Battery Company**), with headquarters at Depew, N. Y. He succeeds **H. G. Barnes,** whose promotion to vice-president in charge of sales of the parent organization was reported in the *Railway Age* of January 27. Prior to

Richard A. Rowland

his new connection Mr. Rowland was vice-president of the Saint Paul Engineering and Manufacturing Company, St. Paul, Minn.

Gross sales of the **American Locomotive Company** during 1944 amounted to $312,722,343 as compared with $428,905,657 in 1943. Despite the lower output, net profit, exclusive of gain on security investments sold, amounted to $6,369,407, as compared with $6,626,515 in 1943, the slight difference being due to the transition during the year from lower profit cost-plus-fixed-fee business to the production of locomotives and other commercial products at fixed price.

During 1944 the company sold its entire holdings of the Superheater Company and about 29 per cent of its investment in the common stock of the General Steel Castings Corporation for a net gain of $2,295,261, bringing total net profit carried to surplus for the year to $8,664,668. After the payment of dividends, the purchase of preferred shares on behalf of the sinking fund, and other expenditures for improvement in plant, net working capital at December 31, 1944 amounted to $33,735,000. The company's output of steam locomotives last year was the highest since 1923, and Diesel locomotive tonnage delivered was 60 per cent greater than 1943, the previous peak year. During 1944, output gradually shifted from combat vehicles to peak production of regular products, principally steam and Diesel locomotives for the combat areas, by the year's end, the company's facilities had been substantially converted to peacetime production. However, the large-scale manufacture of combat tanks at Schenectady, N. Y., and Montreal, Canada, was resumed in January of this year.

In the annual report, W. C. Dickerman, chairman, reported that additional facilities for the manufacture of Diesel locomotives and other products were installed during the year as part of a policy to enlarge the company's output to meet anticipated post-war demand. Other similar expenditures will be required and are being anticipated. Reviewing the company's accomplishments during the five war years, 1940 to 1944 inclusive, Mr. Dickerman declared that during these years, the company delivered $1,156,000,000 of product, approximately equivalent to its total output for the quarter-century 1901-1925 inclusive. Of this total, $864,000,000 was for war and $292,000,000 for commercial products. Important war materiel included delivery of 11,490 combat vehicles, 2,100,000 shells and 3,463 steam and Diesel locomotives. The rate of net profit earned on sales was 2.3 per cent.

As of a recent date, unfilled orders totaled $260,000,000, including $117,000,000 for war products and $118,000,000 for steam and Diesel locomotives. Mr. Dickerman said many factors support the belief that a growing market is in prospect for locomotives. "Accelerated utilization of existing railroad power, competition of other forms of low-cost transportation and the present strong financial position of the domestic railroads should motivate them to seek modern, efficient locomotives. A strong foreign demand for locomotives also prevails. Until the devastated production centers of Europe are rehabilitated, American locomotive builders will be called upon—in addition to their normal foreign business—to supply the motive power to rebuild European and other foreign transportation systems. Likewise the normal flow of other company products curtailed by war—Diesel engines, springs and tires, forgings, heat exchangers, etc.—will be released in the immediate post-war period to speed the reconversion of American industry and the rehabilitation of Europe."

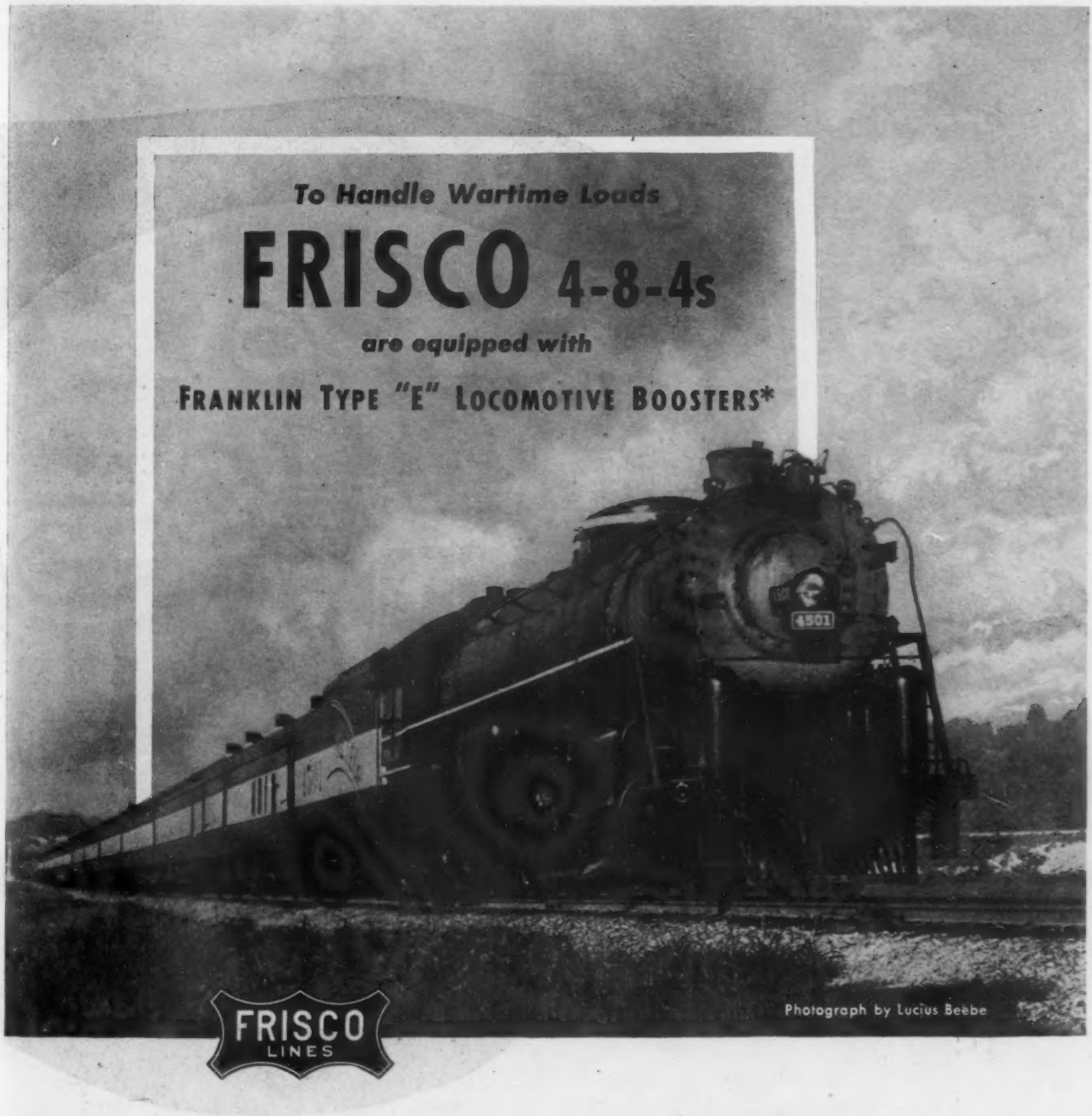
OBITUARY

Benjamin Nields, assistant vice-president of the National Malleable & Steel Castings Co., died February 26. He was 63 years of age. Mr. Fields was in charge of the company's New York sales office from 1909 to 1931, when he returned to Cleveland, Ohio, as assistant vice-president.

James Lincoln Ashley, a director of the International Nickel Company of Canada, Ltd., died March 6. He was 75 years of age. Mr. Ashley was formerly secretary and treasurer of the International Nickel Company of Canada and vice-president and treasurer of the International Nickel Company, the United States subsidiary.

G. A. Bahler, who retired in 1943 as general traffic manager of the Caterpillar Tractor Company, with headquarters at Peoria, Ill., died in San Leandro, Cal., on February 16.

News Department continued on second left-hand page



These Frisco 4500 class 4-8-4 locomotives equipped with

FRANKLIN TYPE "E" BOOSTERS*

are used for both fast passenger and freight service to increase traffic capacity.

*Trade Mark Reg. U. S. Pat. Off.

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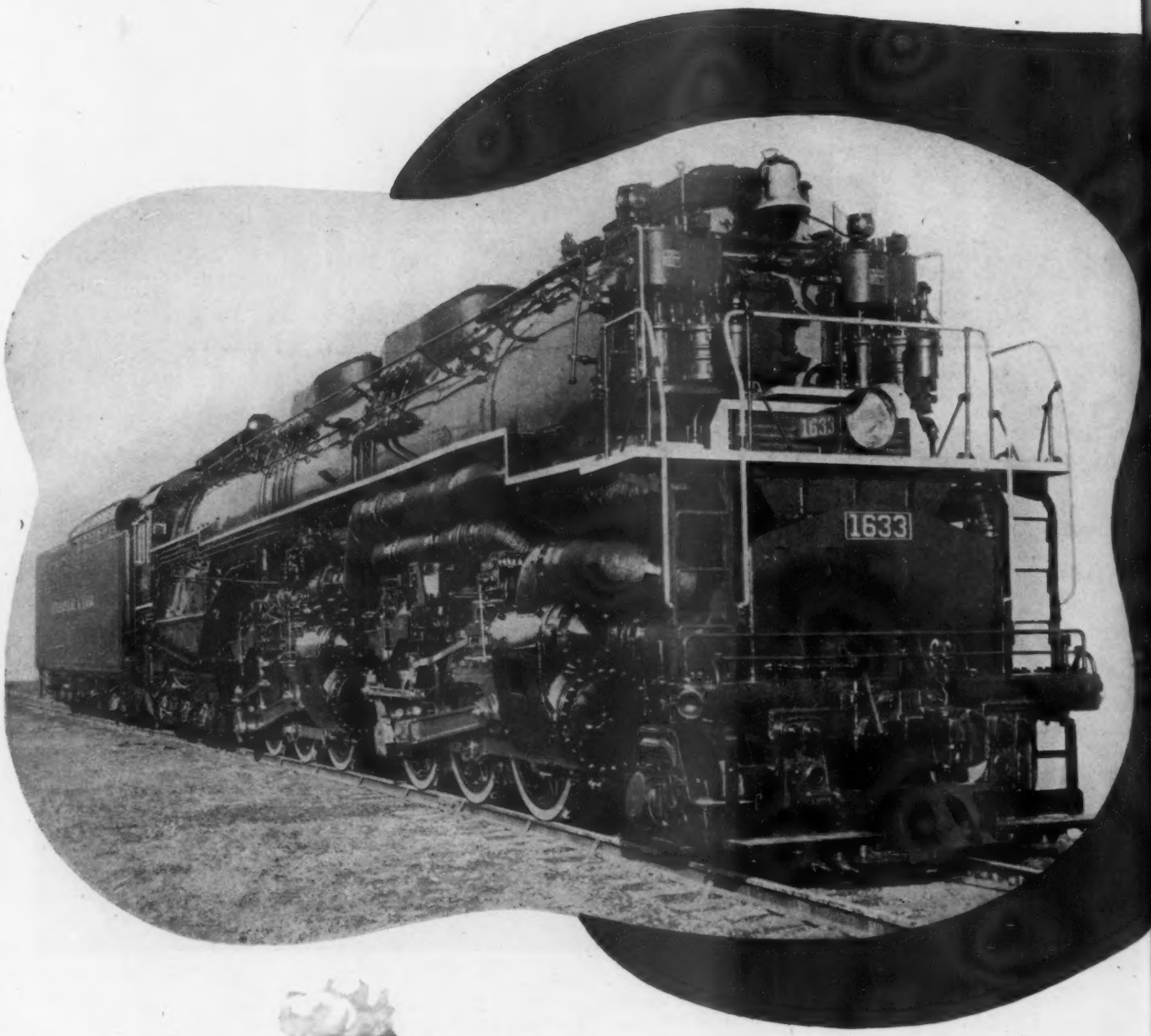

LIMA
LOCOMOTIVE WORKS
INCORPORATED

LIMA LOCOMOTIVE

was ready!

Realizing the tremendous role that coal plays in modern warfare, the Chesapeake & Ohio had the foresight to plan far in advance for motive power to handle the vastly increased tonnage of coal which must be speeded over its lines.

Five years ago the C & O ordered ten 2-6-6-6 Lima Locomotives, specially designed to haul heavy trains over the steep grades of the Allegheny Mountains. This fleet has been steadily augmented until forty-five of these "Allegheny" type giants are now moving the coal so vital to the successful carrying on of the war.

High efficiency and low maintenance costs are two outstanding features of this locomotive.

WORKS, INCORPORATED LIMA, OHIO

Construction

BALTIMORE & OHIO.—This railroad has awarded a contract for grading, masonry, excavation, drainage, track laying and surfacing, etc., for construction of its Williams Camp run spur track in West Virginia, at estimated cost of $130,000, to the Sutton Company, Radford, Va.

SOUTHERN.—This railroad has authorized an extension to its passing track and water facilities and the installation of remote control signals between Austell and Douglasville, Ga., at an estimated cost of $52,542. The work will be carried out by the railroad's own forces. The Southern also has awarded a contract for constructing a new pier, replacing an abutment damaged by flood and installing an additional steel span over Difficult creek, near Scottsburg, Va., at estimated cost of $34,500 to F. A. Triplett, Chester, S. C.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Annual Report.*—The 1944 annual report of this road shows a net income, after interest and other charges, of $54,542,635 as compared with $57,440,364 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	13,092.20	-48.09
RAILWAY OPERATING REVENUES	$528,080,530	+$56,961,515
Maintenance of way and structures	64,304,279	+12,503,722
Maintenance of equipment	81,778,141	+11,709,401
Transportation—rail line	142,317,908	+21,361,328
TOTAL OPERATING EXPENSES	303,738,777	+47,282,682
Operating ratio	57.52	+3.08
NET REVENUE FROM OPERATIONS	224,341,754	+9,678,834
Railway tax accruals	158,347,230	+13,477,592
RAILWAY OPERATING INCOME	65,994,523	-3,798,759
Net equipment and joint facility rents—Net Dr.	5,815,596	+1,862,062
NET RAILWAY OPERATING INCOME	60,178,928	-5,660,820
Total other income	4,955,425	+1,742,648
TOTAL INCOME	65,134,352	-3,918,173
Interest on funded debt	10,003,390	-941,859
TOTAL DEDUCTIONS FROM GROSS INCOME	588,328	-78,583
INCOME BALANCE CARRIED TO PROFIT AND LOSS	54,542,635	-2,897,729

ATLANTIC COAST LINE.—*Sells L. & N. Stock.*—The Atlantic Coast Line has sold 369,973 shares of the new stock of the Louisville & Nashville to Morgan Stanley & Co. and associated underwriters at an undisclosed price. Proceeds from the sale of these shares, with cash from the company's treasury, will be used to redeem the remaining $20,000,000 of Atlantic Coast Line-Louisville & Nashville collateral trust 4 per cent bonds, due in 1952. On November 1, last, $9,000,000 of this issue was called for payment at 105.

The Atlantic Coast Line now owns 596,700 shares of $100-par value out of the 1,170,000 outstanding shares of Louisville & Nashville stock. The Interstate Commerce Commission has authorized a two-for-one split up of these shares by reducing the par value to $50 each. Upon completion of the split-up, the Atlantic Coast Line would have 1,193,400 of new L. & N. shares and, after the sale to the underwriters of the 369,973 of these, will own 823,427 new shares. With the redemption of the collateral trust bonds, which are secured by the L. & N. stock, these 823,427 new shares of L. & N. will become a free asset in the treasury of the Atlantic Coast Line. The Coast Line has 823,427 common shares outstanding and its holdings of L. & N. stock will be equal to the number of its issued common shares.

ALTON.—*Promissory Notes.*—This road has applied to the Interstate Commerce Commission for authority to issue $838,128 of promissory notes in connection with the purchase, under a conditional sale arrangement, of three 4,000-hp. diesel-electric passenger locomotives from the Electro-Motive Division of General Motors Corporation at $349,220 each.

CANADIAN PACIFIC.—*Annual Report.*—Financial results reported by the Canadian Pacific for the year ended December 31, 1944, are as follows:

	Income Account
Gross earnings	$318,871,034
Working expenses (including taxes)	275,711,370
Net earnings	$43,159,664
Other income	12,371,315
Income available for fixed charges	$55,530,979
Fixed charges	20,831,149
Net income	$34,699,830
Dividends:	
Preference stock:	
2% paid August 1, 1944	$2,521,391
2% payable February 1, 1945	2,521,391
Ordinary stock:	
2% paid December 1, 1944	6,700,000
Balance to profit and loss	$22,957,048
	Profit & Loss Account
Balance, December 31, 1943	$231,234,218
Dividend on ordinary stock, from 1943 earnings, paid March 31, 1944	6,700,000
	$224,534,218
From income account for year 1944	22,957,048
Received from Great Northern for release from obligations under joint agreement	4,500,000
Portion of steamship insurance recoveries representing compensation for increased cost of tonnage replacement	1,045,235
	$253,036,501
Deduct:	
Net exchange charges in respect of steamship insurance recoveries and expenditures for new steamship	1,045,234
Miscellaneous-debt debit	678,239
Profit & Loss balance December 31, 1944	$251,715,008

CHICAGO & NORTH WESTERN.—*Refinancing.*—This company has applied to the Interstate Commerce Commission for authority to issue $54,000,000 of series B first mortgage bonds to mature January 1, 1989, the proceeds of which will be used to retire the following securities: $47,979,442 of series A first and general mortgage 4 per cent bonds, $4,000,000 of Sioux City & Pacific divisional first mortgage 4 per cent bonds, and $2,486,000 of Des Plaines Valley divisional first mortgage 4 per cent bonds. Although this road recently emerged from reorganization, improved market conditions are said to offer an opportunity to refinance these 4 per cent bonds at a substantial interest saving, the exact amount to depend on the rate to be paid on the new issue, which will be determined by competitive bidding.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Will Repay Ten Million Loan.*—Another step toward taking the Chicago, Milwaukee, St. Paul & Pacific out of bankruptcy within the next few months went into effect last week when Federal Judge Michael L. Igoe approved an order permitting the road to repay a loan of $10,442,827 to the R. F. C., after it was shown that the Milwaukee now has cash on hand in the sum of $128,769,900.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*R. F. C. Sale of Securities.*—Sale to Halsey, Stuart & Company of $1,344,000 of this road's 2½ per cent equipment trust certificates has been announced by the Reconstruction Finance Corporation.

FLORIDA EAST COAST.—*Promissory Notes.*—Division 4 of the Interstate Commerce Commission has authorized this road to issue $1,969,488 of promissory notes in further evidence, but not in payment, of the unpaid portion of the cost of 15 2,000-hp. diesel-electric locomotives procured from the Electro-Motive Division of General Motors Corporation at a total expenditure of $2,625,984. No bids having been submitted for financing the transaction under an equipment trust representing 90 per cent of the cost of the equipment, the bid of the Chase National Bank for 2 per cent notes representing 75 per cent of the cost was accepted.

FLORIDA EAST COAST.—*Reorganization.*—The St. Joe Paper Company has asked the Interstate Commerce Commission to modify the terms of its plan for the reorganization of this road under section 77 of the Bankruptcy Act. Under the plan, as reported in *Railway Age* of January 20, page 186, the paper company, which is controlled by the Alfred I. duPont estate, would be allotted a majority of the new company's stock. The new company's securities would include no fixed-interest debt (except equipment obligations), but would consist of $20,250,000 of common stock and an equal amount of 4½ per cent income bonds. The paper company has asked the commission to authorize $20,250,000 of 5 per cent voting preferred stock, instead of the income bonds, to the extent that creditors assigned the bonds may elect to take such stock. The preferred stock would be cumulative up to two years, and after a 5 per cent dividend had been paid on the common would participate equally in additional dividends. In addition, the commission also was asked to modify the provisions for the income bonds to eliminate any premium on their redemption.

Among other proposals for modifications of the commission's plan, S. A. Lynch and others, whose alternate plan under which

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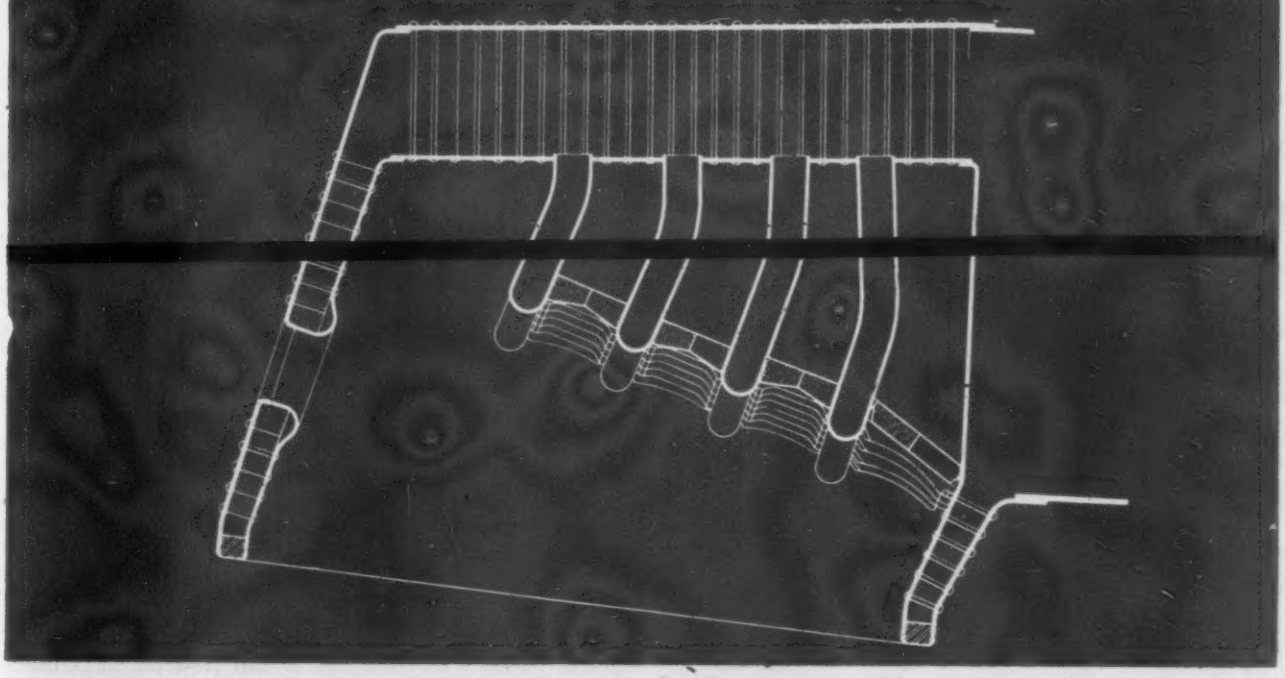
TO SAFEGUARD THE ENTIRE CROWN SHEET



THE installation of Security Circulators assures a positive flow of water over the crown sheet at all times. To give complete protection the Security Circulators should be adequate in number and suitably spaced from the flue sheet to the door sheet.

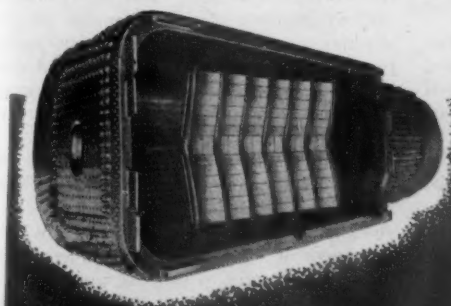
OTHER OUTSTANDING ADVANTAGES

Security Circulators are adaptable to any type of locomotive and to any size of firebox.

They increase the strength of the firebox structure and help to prevent boiler distortion.

They form an ideal support both for crown sheet and arch brick, and permit the use of a 100% arch in any type of firebox.

The installation of Security Circulators makes locomotives available for continuous operation over longer periods of time. Such locomotives have better combustion and longer arch life with less flue plugging and less cinder wear, so that a minimum of boiler maintenance is required.



AMERICAN ARCH COMPANY, Inc.

NEW YORK • CHICAGO

SECURITY CIRCULATOR DIVISION

the Atlantic Coast Line would obtain control of the F. E. C. through purchase of a majority of the new company's stock was submitted a short time before the commission's now current plan was made public, have asked that the commission afford a further hearing to their proposal, asserting that such hearing would show the finding that the Lynch plan is "prima facie impracticable" to be without warrant.

GULF, MOBILE & OHIO.—*Annual Report.*—The 1944 annual statement of this road shows a net income, after interest and other fixed charges, of $3,218,150, as compared with $4,328,168 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	1,962.81	−9.6
RAILWAY OPERATING REVENUES	$37,736,686	−$122,009
Maintenance of way and structures	6,663,631	+796,968
Maintenance of equipment	6,429,565	+419,185
Transportation	10,397,786	+99,327
TOTAL OPERATING EXPENSES	25,952,250	+1,232,235
Operating ratio	68.77	+3.47
NET REVENUE FROM OPERATIONS	11,784,435	−1,354,244
Railway tax accruals	5,275,655	+256,449
RAILWAY OPERATING INCOME	6,508,780	−1,610,693
Net Rents, Dr.	1,883,872	−316,667
NET RAILWAY OPERATING INCOME	4,624,909	−1,294,027
Other income	158,143	−27,445
TOTAL INCOME	4,783,051	−1,321,472
Rent for leased roads and equipment	169,515	+167
Total miscellaneous deductions	42,726	+9,882
TOTAL FIXED CHARGES	1,124,743	−226,565
Total contingent charges	397,433	+5,229
NET INCOME	3,218,150	−1,110,018

MINNEAPOLIS & ST. LOUIS.—*Cumulative Vote Plea.*—When the annual meeting of the Minneapolis & St. Louis is held on April 3 stockholders will be asked to vote on a proposal that articles of incorporation be amended to provide that shareholders shall be entitled to the right of cumulative voting. A similar proposal was rejected when the annual meeting was held last year.

MISSOURI-KANSAS-TEXAS. — *Equipment Trust Certificates.*—Division 4 of the Interstate Commerce Commission has authorized this road to assume liability for $952,000 of 1½ per cent equipment trust certificates, sold at 99.65 to Halsey, Stuart & Company, in connection with the procurement of 300 automobile box cars to be built by the M.-K.-T. of Texas as an independent contractor. (Previous item in *Railway Age* of February 24, page 402.) The division pointed out that the road's annual fixed-interest charges had been reduced in the past three years from $4,335,066 to $2,547,398.

NEW YORK, ONTARIO & WESTERN.—*R. F. C. Loan.*—This road, having failed to find a satisfactory commercial source of funds, has asked the Interstate Commerce Commission for authority to borrow $1,900,000 from the Reconstruction Finance Corporation in connection with its purchase, at a total cost of $2,244,073, of four 5,400-hp. diesel-electric freight locomotives and one 2,700-hp. diesel-electric freight locomotive.

MISSOURI-KANSAS-TEXAS.—*Annual Report.*—Operating revenues in 1944 topped all previous records in the company's history. The sources from which these revenues were derived and how the income was used is explained in the accompanying table from the company's annual report.

REVENUES FROM OPERATION WERE DERIVED FROM THE FOLLOWING SOURCES	1944	Percentage Change Compared with 1943
Transportation of freight	$64,057,249	+8.17
Transportation of passengers	13,918,458	−1.47
Transportation of mail, express and other service	6,046,335	+6.44
Making a total operating revenue of	84,022,042	+6.32
Other income was	307,124	−4.73
Making a total income of	84,329,166	+6.28
HOW INCOME WAS USED		
Wages and salaries paid employees (charged to expenses)		$33,500,604
Miscellaneous materials, rental of equipment and facilities, etc.		23,751,632
Taxes		10,542,789
Locomotive fuel		4,717,274
Depreciation charge on rolling stock and roadway structures		2,097,536
		$74,609,835
LEAVING for fixed and contingent charges		9,719,331
INTEREST on mortgages, conditional sales contracts and other fixed and contingent charges was		3,609,216
RESULTING in net income after fixed charges and other deductions		6,110,115
OF WHICH there was appropriated for possible increase in tax liability and for other purposes		2,000,000
Balance of income transferred to earned surplus		$4,110,115

MISSOURI-KANSAS-TEXAS.—*Proxy Contest.*—A battle for control of the Missouri-Kansas-Texas was joined on March 7 when the management solicited proxies to prevent the possibility of a stockholders' group, including E. N. Claughton of Miami, Fla., the railroad's largest individual stockholder, from obtaining control of the railroad at the annual meeting on April 6.

In a further statement on March 11, President Sloan commented as follows: "My attention has been called to statements appearing in the press emanating from Edward N. Claughton and his associates, in Miami, Fla., in which they indicate that they are endeavoring to obtain control of the Missouri-Kansas-Texas to force a reorganization of the railroad, which they claim would 'vitally affect the financial returns of both the preferred and common stock.' At the present time the railroad has accumulated arrears of interest on its adjustment mortgage bonds of approximately $6,500,000. This interest is senior and comes ahead of dividends on the preferred and common stock. However, during the past two and a half years there has been effected a reduction of annual fixed interest charges of the railroad of over $1,800,000, and we have now reached the point where we are anticipating that the directors, acting in their discretion, will be able shortly to begin reducing the arrearages of interest on the adjustment bonds. The action of the management in reducing debt and fixed charges ahead of the preferred and common stock has, of course, redounded to the benefit of the stockholders as well as the other security holders. This, together with other factors, is reflected by the fact that the market value of preferred stock since October 1, 1942, has increased from 3⅜ to a recent high of 24½, and that the market value of the common stock in this period has increased from ⅞ to a recent high of 8½.

"A few years ago the Katy was on the verge of bankrutpcy, having failed to earn its fixed and contingent interest charges for each of the ten consecutive years 1932 through 1941. A return to a period of prewar earnings would again have confronted us with this possibility if the directors had not wisely and conservatively used the earnings of the present period for the purpose of retiring prior debt, and thus reducing fixed interest charges. By this procedure we have preserved the position of the preferred and common stockholders, and can look forward to the time when, even with greatly decreased post-war earnings, we may reasonably contemplate that our fixed charges can be met and our stockholders will have a chance to share in the earnings of the company.

"For Mr. Claughton and his friends to urge a reorganization of the company at this time is to do the greatest possible disservice to the holders of preferred and common stock, for if the company were put in reorganization at the present time the effect might be to eliminate completely the common stock and possibly also the preferred stock, and make the holdings of stockholders of these classes of stock worthless.

"It is my opinion that the real objectives of Mr. Claughton and his friends is not to improve the position of all the stockholders, as they contend, but rather to overthrow the present sound and conservative management of the railroad company and gain control of it for their own selfish purpose."

About 9,000 proxy letters, each accompanied by the letter signed by Mr. Sloan have been mailed to stockholders. The stockholders' attention is drawn by the management to several amendments Mr. Claughton is said to propose presenting at the annual meeting. One of these involves a reduction in the number of directors from fifteen to nine and the election of these nine on April 6. At present the company has fifteen directors, five of whom are

News Department continued on next left-hand page

Tomorrow's Locomotives

This company is equipped with Research, Engineering and Manufacturing facilities to meet the boiler demands required of tomorrow's steam locomotives for efficiency and power.

Elesco engineers are at your service for consultation at any time.

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COMPANY

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AMERICAN THROTTLES • STEAM DRYERS
EXHAUST STEAM INJECTORS • PYROMETERS

Representative of
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122 S. Michigan Blvd., CHICAGO

• • •

Montreal, Canada
THE SUPERHEATER COMPANY, LTD.

elected at each annual meeting for a term of three years each.

In its proxy statement, the management expresses the opinion that, under Missouri law, no reduction of the number of directors could be effected merely by amending the by-laws. Commenting further on the proposal, the management declared that on April 7, 1944, date of the last annual meeting, Mr. Claughton held 16,000 common shares and 12,850 preferred shares but that as of February 24, 1945, he held 167,400 common shares and 300 preferred shares. (Mr. Claughton's current common stock holdings are reported to be in excess of 200,000 shares.) In a letter to the president on February 5, Mr. Claughton is alleged to have written "we have, myself and my associates, about 40 per cent of the common stock votes. . . . If I could decide to solicit proxies and/or attend your meeting, I believe that we can elect two or perhaps three of the five directors that are due to be elected at this meeting." There are 808,964 common shares and 666,924 preferred shares outstanding, all of which are entitled to vote, according to the company's annual report.

Challenging Mr. Sloan's efforts to line up support for the management, Marvin D. Adams, president of the stockholders' protective committee of the Missouri-Kansas-Texas, urged stockholders to refrain from committing themselves to any proxy at this time. He added, "A vicious attack . . . against Mr. Edward N. Claughton, largest individual stockholder owning more than 20 per cent of the common stock, is being waged by Matthew S. Sloan, president. This, however, in no way affects the stockholders protective committee as Mr. Claughton is neither an officer nor a member of the committee. Mr. Claughton does not seek to become either an officer or a director of the Missouri-Kansas-Texas. In the spirit of fair play we request all stockholders to refrain from any decision until both sides can be properly and, we hope, respectfully heard, as this will vitally affect the financial returns on both preferred and common stock."

Mr. Adams became president of the stockholders' committee when it was chartered recently to work out plans whereby both the common and preferred stockholders may obtain dividends. He is president of the Stembler-Adams-Frazier Insurance Agency and the Atlantic Fruit Corporation, both of Florida and a director of the Florida National Bank & Trust Co. He has established headquarters of the stockholders' protective committee in the Hotel Gotham, New York.

NORTHERN PACIFIC.—*Annual Report.*—During 1944, the Northern Pacific reported a larger volume of freight and passenger traffic handled than in any previous year. Operating revenues of the company amounted to $155,978,310, an increase of $4,446,578 or 2.93 per cent as compared with 1943. Operating expenses increased to $107,618,188, which was $15,482,166 or 16.8 per cent more than in 1943, due in part to increased traffic, but chiefly to the increased cost of labor and material. Taxes amounted to $28,775,859, an increase of $1,171,633 or 4.24 per cent over 1943 and other income amounted to $4,005,143, as compared with $3,929,015. Net income, after all charges, was $13,160,985, a decrease of $12,359,445 or 48.43 per cent, compared with 1943.

During 1944, long-term funded debt was reduced by $11,003,000 and equipment obligations by $3,861,332, resulting in a total reduction in funded debt of $14,894,332. The reduction in long-term debt was due to the purchase by the company in 1944 of $10,515,000 of refunding and improvement bonds at a cost of $9,951,329 and the purchase and cancellation of $518,000 of prior lien 4 per cent bonds under the sinking fund provisions of the prior lien mortgage.

During the year, the company paid in cash $10,902,296 for new equipment and approximately $12,000,000, chargeable to capital account, was spent for improvements to road and equipment. Among the larger improvements completed during the year 1944 was the Diesel locomotive shop at Auburn, Wash. The addition to the company's principal locomotive shop at Livingston, Mont., and the construction of the new tunnel through Bozeman Mountain in Montana, were reported approaching completion. Construction of a new freight car shop, to be built at Brainerd, Minn., was authorized late in 1944 and work is now under way. The shop is estimated to cost about $1,750,000 and will provide modern and efficient facilities for the repairing and building of freight cars, particularly all-steel cars. The program of reduction in curvature and improvement of alignment was continued during the year. Twenty such changes were completed and grading placed for other authorized changes to be completed during 1945. In the annual report, C. E. Denney, president, reports that the Northern Pacific has been handling a heavy movement of men and supplies to the west coast ports served and that the Army, Navy and Office of Defense Transportation have forecast that the railroad's facilities will be strained even further to meet mounting military and civilian demand in 1945.

WESTERN PACIFIC.—*Reorganization Expenses.*—Division 4 of the Interstate Commerce Commission has fixed maximum allowances for compensation and expenses in connection with this road's reorganization for the period from November 1, 1939, to December 31, 1944. Previously allowed compensation and expenses totaled $169,754, while claims were submitted for an additional $515,220. The larger claims, and the amounts fixed in each case, were as follows: Pierce & Greer and Frank C. Nicodemus, Jr., counsel for the debtor, $30,822 and $5,250; Sloss & Turner, counsel for the railroad corporation, $30,425 and $20,725; Davies, Auerbach, Cornell & Hardy, counsel for the Irving Trust Company, trustees, $36,372 and $20,447; Milbank, Tweed & Hope, counsel for the first mortgage trustees, $45,859 and $30,859; Chickering & Gregory, counsel for the first mortgage trustees, $27,964 and $10,464; Crocker First National Bank of San Francisco and Samuel Armstrong, first mortgage trustees, $39,531 and $23,681; Garret McEnerny II, counsel for A. C. James Co., $25,086 and $10,086; Witman, Ransom, Coulson & Goetz, counsel for A. C. James Co., $84,151 and $59,151; A. C. James Co., $10,399 and $10,399; Cravath, Swaine & Moore, counsel for the institutional bondholders' committee, $118,635 and $87,635; and the institutional bondholders' committee, $26,478 and $26,478.

PEORIA & EASTERN.—*Annual Report.*—The 1944 annual report of this road shows a net income, after interest and other charges, of $678,528, as compared with $845,278 in 1943. Selected items from the income statement follow:

	1944	Increase or Decrease Compared With 1943
Average Mileage Operated	211.44	.....
RAILWAY OPERATING REVENUES	$5,178,057	+$421,386
Maintenance of way	850,282	+109,796
Maintenance of equipment	745,424	+45,286
Transportation	1,937,448	+328,418
TOTAL OPERATING EXPENSES	3,759,923	+503,434
Operating ratio	72.61	+4.15
NET REVENUE FROM OPERATIONS	1,418,134	−82,048
Railway tax accruals	646,152	+48,763
RAILWAY OPERATING INCOME	771,982	−130,811
Equipment rents, Net Dr.	64,958	+20,093
Joint facility rents, Net Dr.	63,325	+2,926
NET RAILWAY OPERATING INCOME	643,699	−153,830
Total other income	43,010	−11,204
GROSS INCOME	686,709	−165,034
Miscellaneous rents	8,162	+1,734
TOTAL DEDUCTIONS FROM GROSS INCOME	8,180	+1,715
NET INCOME	678,528	−166,749

PERE MARQUETTE.—*Calls for Bond Redemption.*—The Pere Marquette has called for redemption on May 11 all of its first mortgage bonds outstanding as follows: five per cent, series A, due 1956, at 105 and accrued interest; 4 per cent, series B, due 1956, at 100 and interest, and 4½ per cent, series C, due 1980, at 105 and interest.

Average Prices Stocks and Bonds

	March 13	Last week	Last year
Average price of 20 representative railway stocks	49.93	51.72	40.23
Average price of 20 representative railway bonds	95.69	95.81	86.88

Dividends Declared

Dayton & Michigan.—common, 87½¢, semi-annually; 8% preferred, $1.00, quarterly, payable April 2 to holders of record March 16.

New London Northern.—$1.75, quarterly, payable April 2 to holders of record March 15.

Norwich & Worcester.—8% preferred, $2.00, quarterly, payable April 2 to holders of record March 15.

Pittsburgh, Bessemer & Lake Erie.—75¢, semi-annually, payable April 2 to holders of record March 15.

Savannah & Atlanta.—5% preferred, $1.25, quarterly, payable April 2 to holders of record March 6.

Sharon.—$1.00, payable April 2 to holders of record March 23.

T. C. EQUIPMENT IN EUROPE.—According to the latest releases from the Transportation Corps in Europe, more than 21,000 locomotives and freight cars have been carried to the Continent since D-day, aboard specially converted LST's and train-carrying freighters. Up to January 1, there had been delivered 19,000 cars, 1,500 locomotives, 36 hospital trains and special equipment including cranes, wrecking trains and mobile workshops.

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	Increase or Decrease Compared With 1943
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057	+$421,386
282	+109,796
424	+45,286
448	+328,418
923	+503,434
.61	+4.15
134	−$2,048
252	+48,763
982	−130,811
958	+20,093
325	+2,926
599	−153,830
010	−11,204
709	−165,034
162	+1,734
180	+1,715
528	−166,749

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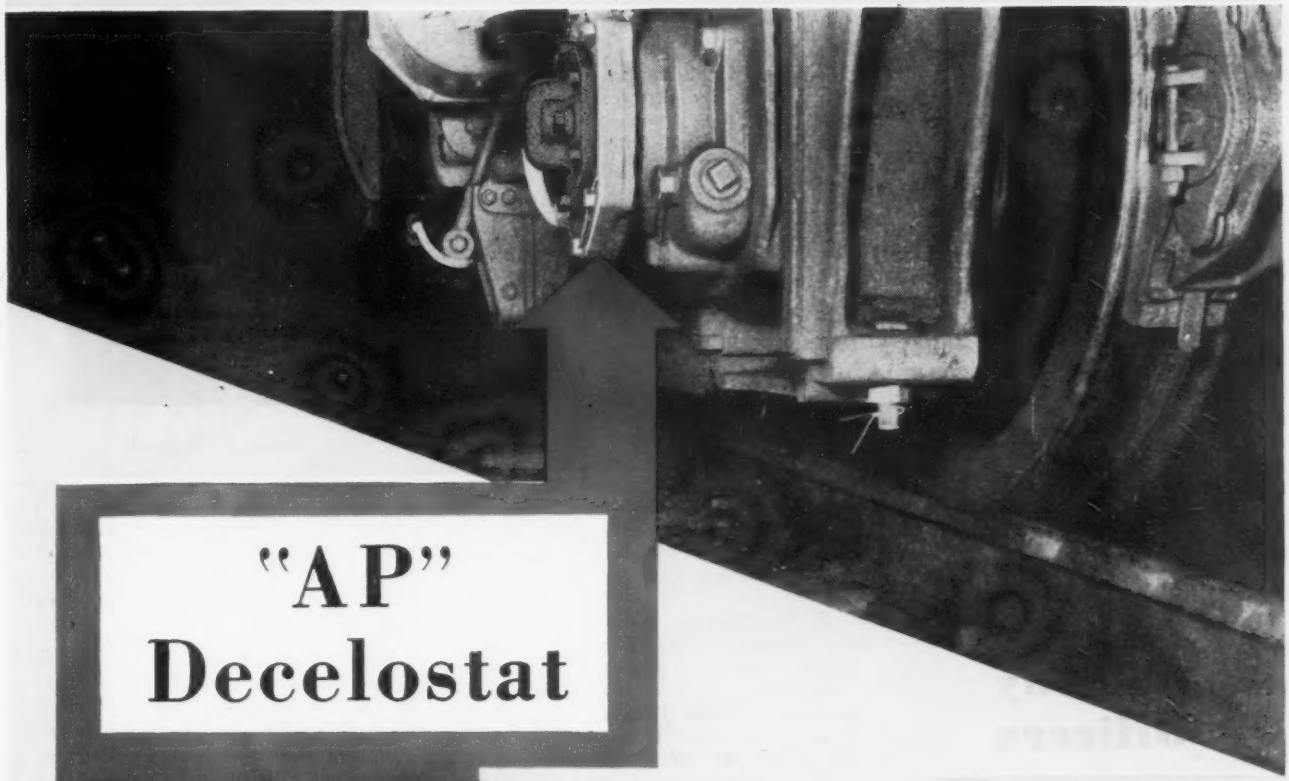
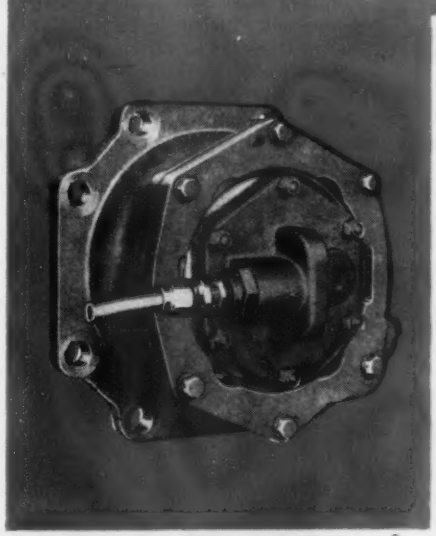


"AP" Decelostat



Softens the Brake When Wheel Slip Impends

THE Decelostat is a sentry that is always at its post—on the wheel—ever on the lookout for irregularity in wheel-rail adhesion.

When brakes are applied it measures rate of retardation. If slippery rail is encountered the Decelostat won't let the wheel slip into a slide. It eases up on the brake, promptly—before the slide can develop. This is done in less than a second.

Braking pressure is softened—but only for the moment, and only on the affected wheels. Then the braking pressure is restored to the existing train level.

Westinghouse Air Brake Company

Wilmerding, Pa.

Abandonments

PENNSYLVANIA.—Division 4 of the Interstate Commerce Commission has authorized this company to abandon its 3.01-mile South Witmer branch at Irvona, Pa.

SEABOARD AIR LINE.—Division 4 of the Interstate Commerce Commission has authorized this road to abandon a branch from Tredegar, Ala., to Jacksonville, 3.26 miles, prescribing the conditions for the protection of employees who may be adversely affected which were specified in the Burlington case, 257 I. C. C. 700.

TEXAS & PACIFIC.—Division 4 of the Interstate Commerce Commission has extended for a further period of two years its reservation of jurisdiction for the protection of employees who may be affected by this road's line abandonment authorized in the Finance Docket No. 13319 proceedings. The division's action was similar to that taken recently in several abandonment cases in which the original 2-year reservation period was about to expire, as noted in this column, and followed an application by the Railway Labor Executives Association asking such action in the event the division did not see fit to prescribe definite conditions for the protection of employees such as were specified in the Burlington case, 257, I. C. C. 700.

Railway Officers

EXECUTIVE

Frank Karr, vice-president and chief counsel of the Pacific Electric, with headquarters at Los Angeles, Cal., has retired after 42 years of service.

William W. Abendroth, district passenger agent of the Chesapeake & Ohio at Cleveland, Ohio, has been appointed special representative in the office of the assistant vice-president—assistant to the president at Cleveland.

S. O. Berg, head bookkeeper to the comptroller of the Chicago, Indianapolis & Louisville, at Chicago, has been advanced to assistant to the vice-president in charge of mail and express traffic, with the same headquarters, succeeding **F. C. Berghaus,** whose promotion to freight claim agent is reported elsewhere in these columns.

FINANCIAL, LEGAL AND ACCOUNTING

C. W. Cornell has been appointed general attorney of the Pacific Electric, with headquarters at Los Angeles, Cal.

George Craig, whose appointment as treasurer and assistant secretary of the Lehigh & New England, the Lehigh Coal & Navigation Co., and affiliates, with headquarters at Philadelphia, Pa., was announced in the *Railway Age* of February 10, was born at Philadelphia on February 1, 1908, and attended Girard College and the Wharton School of Finance & Commerce of the University of Pennsylvania. Mr. Craig entered railroading in the treasury department of the Lehigh & New England and its affiliates in 1926. He was appointed assistant treasurer in 1934, and remained in that post until his recent promotion to treasurer and assistant secretary.

John D. Strauch, Jr., secretary to the financial vice-president of the Baltimore & Ohio, has been appointed assistant secretary of the company with headquarters at Baltimore, Md.

F. C. Berghaus, assistant to the vice-president of the Chicago, Indianapolis & Louisville, at Chicago, has been promoted to freight claim agent, with the same headquarters, succeeding **W. E. Lawson,** whose death on February 21 is mentioned elsewhere in these columns.

E. P. Reynolds, supervisor, merchandise and refrigeration service, of the Chesapeake & Ohio at Richmond, Va., has been appointed freight claim agent with the same headquarters, succeeding in part to the duties of Charles O. Miller, freight claim agent—chief special agent, whose death on February 17 was reported in the *Railway Age* of February 24.

F. H. Jeffrey, assistant treasurer of the Chicago, Milwaukee, St. Paul & Pacific, has been promoted to treasurer with headquarters as before at Chicago, succeeding **John Dickie,** whose recent death was reported in the *Railway Age* of March 3. **W. W. Beckman,** receiving clerk of the treasurer's office at Chicago, has been advanced to assistant treasurer with the same headquarters, replacing Mr. Jeffrey.

Glenn O. Kidd, whose appointment as secretary and assistant treasurer of the Lehigh & New England, the Lehigh Coal & Navigation Co., and affiliates, with headquarters at Philadelphia, Pa., was announced in the *Railway Age* of February 10, was born at Lawrenceburg, Tenn., on August 24, 1915, and received his B. S. degree from Washington University in 1936 and his LL.B. degree from George Washington University in 1940. He was employed by the Interstate Commerce Commission from July 1, 1936, to January 15, 1941, when he joined the Lehigh & New England as assistant secretary, the position he held at the time of his recent appointment as secretary and assistant treasurer.

OPERATING

James E. Maxwell, whose appointment as superintendent of transportation of the Baltimore & Ohio at Pittsburgh, Pa., was announced in the *Railway Age* of January 13, was born in Harrison County, W. Va., on May 23, 1896, and attended the National University of Law at Washington, D. C. He entered railroading with the Baltimore & Ohio in September, 1910, as an operator on the Monongah division, and after leaving that road in November, 1917, he returned one year later as clerk to chief dispatcher of the Monongah division. He served as dispatcher from October, 1919, until May, 1929, when he became division operator at Parkersburg, W. Va. Mr. Maxwell subsequently was on furlough from 1932 to June, 1941, when he was named acting trainmaster at Wheeling, W.

James E. Maxwell

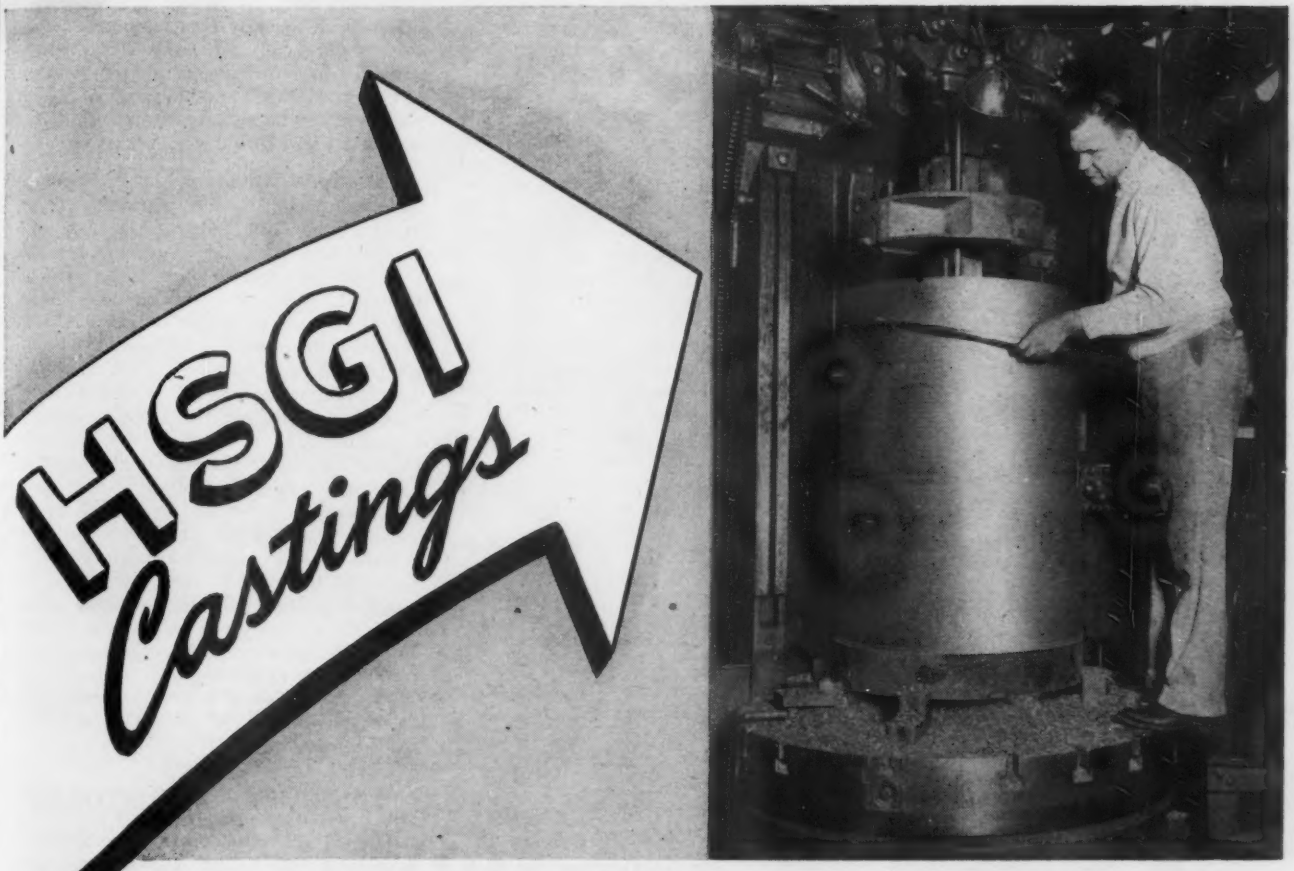
Va., where he was appointed trainmaster in August of the following year. On December 10, 1943, he was advanced to assistant superintendent at Punxsutawney, Pa., the position he held at the time of his recent promotion to superintendent of transportation.

Harry D. Graffious, whose appointment as superintendent of the Baltimore & Ohio at Punxsutawney, Pa., was announced in the *Railway Age* of January 13, joined the Baltimore & Ohio in August, 1909, as an operator at Pittsburgh, Pa., and after subsequent transfers to various points in Pennsylvania and Maryland, he became dispatcher at Pittsburgh in March, 1916. Three years later he was named assistant trainmaster there, becoming trainmaster in

Harry D. Graffious

September, 1920. After serving as day terminal trainmaster and dispatcher successively at Glenwood, Pa., from July, 1923, to January, 1927, he returned to Pittsburgh as dispatcher, remaining there until May, 1937, when he became trainmaster at East Salamanca, N. Y. He transferred to Pittsburgh in March, 1941, and the following October he was advanced

News Department continued on next left-hand page



Conversation with Joe . . .

You: *Say, Joe, what's that bushing casting made from?*

Joe: *That's gun iron, Mister.* (Joe means HUNT-SPILLER *Air Furnace* GUN IRON.)

You: *Is that good iron?*

Joe: *You bet. I can turn it faster without hurting my cutting tool. Besides, there's less stock to remove because HSGI castings come pretty close to finished size.*

Most "Joes" would tell a similar story, because wherever you go, among railroad shops, HUNT-SPILLER *Air Furnace* GUN IRON is an old stand-by. Maybe your road is already an HSGI user. If so, check the complete list of applications below. Unless you use them all, you are not getting greatest efficiency in the shop and on the road.

HSGI
Reg. U.S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Finished Parts
Dunbar Sectional Type Packing
Duplex Sectional Type Packing
for Cylinders and Valves
(Duplex Springs for Above
Sectional Packing)
Cylinder Snap Rings
Valve Rings, All Shapes
Light Weight Valves
Cylinder Liners and Pistons
for Diesel Service

HUNT-SPILLER MFG. CORPORATION

N. C. Raymond, *President* — E. J. Fuller, *Vice-Pres. & Gen. Mgr.*

Office & Works
383 Dorchester Ave. — South Boston 27, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 5575 Cote St. Paul Rd., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER GUN IRON
Air Furnace

to assistant superintendent there, the position he held at the time of his recent promotion to superintendent.

Kenneth T. Reed, whose promotion to superintendent of the Chicago-Petoskey division of the Pere Marquette, with headquarters at Grand Rapids, Mich., was reported in the *Railway Age* of March 3, was born at South Bend, Ind., on July 21,

Kenneth T. Reed

1909, and entered railway service in October, 1929, as a yard clerk of the Pere Marquette at Grand Rapids. On February 2, 1933, he was advanced to yardmaster, with the same headquarters, and on February 17, 1941, he was promoted to assistant trainmaster of the Chicago division, with headquarters at New Buffalo, Mich. On June 1, 1942, Mr. Reed was further advanced to trainmaster at Grand Rapids, the position he held at the time of his new appointment.

TRAFFIC

Hugh E. Hamilton, commercial agent of the Southern at Pittsburgh, Pa., has been promoted to district freight and passenger agent with the same headquarters.

C. R. Throckmorton, traveling passenger agent of the Northern Pacific at Seattle, Wash., has been promoted to division passenger agent, with the same headquarters.

D. W. Anderson, division freight agent of the Seaboard Air Line at Atlanta, Ga., has been appointed general agent at Chattanooga, Tenn., and **L. W. Fincher** has been named division freight agent at Atlanta succeeding him.

I. C. Bruce, general passenger agent of the Chicago, Rock Island & Pacific, at Chicago, has been promoted to assistant passenger traffic manager with the same headquarters.

Edward G. Waterman, traveling freight agent of the Chicago, Burlington & Quincy, with headquarters at Cincinnati, Ohio, has been promoted to general agent at Milwaukee, Wis., succeeding **C. J. Leydon,** whose death on February 17 is reported elsewhere in these columns.

John C. Metz, clerk in the freight traffic department of the Chesapeake & Ohio at Cleveland, Ohio, has been named district passenger agent there succeeding **William W. Abendroth,** whose appointment as special representative is announced elsewhere in these columns.

Thomas J. Pendergast, general traffic agent of the Illinois Central at Chicago, has been promoted to general freight agent, with headquarters at New Orleans, La. **Philip A. Webb,** assistant general traffic agent, has been advanced to general traffic agent, with headquarters as before at Chicago, succeeding Mr. Pendergast.

R. E. Beauvais, general agent of the Chicago, Milwaukee, St. Paul & Pacific at Duluth, Minn., has been promoted to division freight and passenger agent, with headquarters at Dubuque, Iowa. **Paul F. Gehrig,** special coal agent with headquarters at Minneapolis, Minn., has been advanced to general agent at Duluth, succeeding Mr. Beauvais.

R. F. Arroyo, general agent, passenger department, of the Erie at Jersey City, N. J., has been appointed manager, mail, baggage and express traffic, at New York, succeeding **C. L. Chapman,** deceased. **F. J. Wild,** general agent, passenger department, at New York, has been transferred to Jersey City replacing Mr. Arroyo, and **J. H. Dimke,** traveling passenger agent at Jersey City, has been promoted to general agent, passenger department, at New York, to succeed Mr. Wild.

Howard A. Lowry, whose promotion to assistant traffic manager of the Texas & Pacific, with headquarters at Chicago, was announced in the *Railway Age* of March 10, was born at Rome, Ga., on May 18, 1894. He entered railway service in April, 1913, with the Southern at Atlanta, Ga., and in April, 1917, he went with the Texas & Pacific as chief clerk, with the same headquarters. From December, 1917, to March, 1919, Mr. Lowry served with the United States Army and on March 1, 1920, he returned to the T. & P. as general agent with headquarters at Birmingham, Ala. Later he was transferred to New Orleans, La., Pittsburgh, Pa., and to St. Louis, Mo. On May 15, 1940, Mr. Lowry was transferred to Chicago, where he was located at the time of his new appointment.

Weyman P. Hickey, whose appointment as assistant freight traffic manager of the Seaboard Air Line at Savannah, Ga., was announced in the *Railway Age* of February 10, was born at Lumpkin, Ga., on April 29, 1895, and attended Emory University at Oxford, (now Atlanta) Ga. He entered railway service in January, 1914, in the local agency of the Atlanta, Birmingham & Atlantic (now the Atlanta, Birmingham & Coast) at Moultrie, Ga., remaining there until 1917, when he joined the United States Army, serving as a lieutenant in the infantry. In January, 1919, he became a clerk of the Georgia Northern at Moultrie, remaining there until October, 1920, when he entered the service of the Georgia, Florida & Alabama (now the Seaboard) as traveling freight agent at Bainbridge, Ga. He served as commercial agent of the Macon, Dublin & Savannah at Macon, Ga., and Atlanta from January, 1922, to September, 1927, when he joined the Seaboard in a similar capacity at Macon, subsequently transferring, in 1929, to Greenville, S. C. In July, 1936, he was advanced to assistant general freight agent at Charlotte, N. C., and he remained in that post until his recent promotion to assistant freight traffic manager.

Charles W. Gowl, whose promotion to assistant freight traffic manager of the Southern at Birmingham, Ala., was announced in the *Railway Age* of March 10, was born at Harrisonburg, Va., on September 12, 1905, and was graduated from the University of Virginia in 1928. He entered railroad service in August, 1928, as a clerk of the Southern at Washington, D. C., and was advanced to rate clerk in the office of the district freight agent at Columbia, S. C., in October, 1929, becoming chief clerk to the district freight agent at Cincinnati, Ohio, the following February. Mr. Gowl was promoted to special freight traffic representative at New York on August 4, 1930, and subsequently served there as traveling freight and passenger agent, district freight and passenger agent, and general eastern freight agent successively. He was appointed assistant general freight agent at Birmingham on November 16, 1942, and remained in that post until his recent advancement to assistant freight traffic manager.

PURCHASES AND STORES

Daniel W. Corcoran, general storekeeper of the Chicago & North Western, whose retirement was announced in the *Railway Age* of March 10, was born in Clinton, Iowa. He entered railway service in 1905 as a clerk of the North Western with headquarters at Chicago. Mr. Corcoran served later as stock clerk in the stores department until 1919 when he was appointed chief section storekeeper with the same headquarters. In 1920 he was advanced to traveling storekeeper, remaining in that position until January, 1925, when he was promoted to assistant general storekeeper. In October of that year he became general storekeeper, the position he held at the time of his retirement.

SPECIAL

W. J. Melvin, assistant chief special agent of the Chesapeake & Ohio at Richmond, Va., has been promoted to chief special agent there, succeeding in part to the duties of Charles O. Miller, freight claim agent—chief special agent, whose death on February 17 was reported in the *Railway Age* of February 24.

OBITUARY

H. A. Argo, division storekeeper of the Atlanta, Birmingham & Coast at Manchester, Ga., died there on February 17.

W. E. Lawson, freight claim agent of the Chicago, Indianapolis & Louisville, at Chicago, died in an Oak Park (Ill.) hospital on February 21.

Clyde C. Dibble, assistant to the vice-president in charge of purchases and supplies of the New York Central, with headquarters at Indianapolis, Ind., died at his home in that city on March 6. Mr. Dibble

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"A.W." SUPER-DIAMOND

RESISTS SLIPPING IN ANY DIRECTION

Sure footing means fast loading . . . and fast loading means time saved . . . Sure footing with "A.W." Rolled Steel Floor Plate—for workers in industrial plants, refineries, railroads, on ship-board. "A.W." Rolled Steel Floor Plate is fire-proof, heat-proof, oil-proof, crack-proof. Toughest wear will not damage it. Can be installed almost overnight without disturbing production. Write for folder.

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ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PENNSYLVANIA : SINCE 1826. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

was born at Elkhart, Ind., on September 1, 1882, and entered railway service in 1900 in the Elkhart shops of the Lake Shore & Michigan Southern (now part of the N. Y. C.), and one year later he went with the Indiana, Illinois & Iowa (also now a part of the N. Y. C.) as a storekeeper, with headquarters at Kankakee, Ill. In 1903 Mr. Dibble returned to the L. S. & M. S., as a storekeeper at Air Line Junction, Ohio, later being promoted to assistant general storekeeper. In 1920 he was advanced to supervisor of stores of the New York Central System at Indianapolis, and in 1923 he was promoted to general supervisor of stores, with the same headquarters. In 1944 Mr. Dibble was advanced to the position he held at the time of his death.

C. J. Leydon, general agent of the Chicago, Burlington & Quincy, with headquarters at Milwaukee, Wis., died at that city on February 17.

William A. Kingsland, who retired in 1938 as vice-president of the Canadian National, died at Toronto, Ont., on February 25. He was 76 years old.

Richard J. Sullivan, who retired in 1918 as division superintendent of the Missouri-Kansas-Texas, at Greenville, Tex., died at Wichita Falls, Tex., on January 9.

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Compiled from 131 reports (Form 1BS) representing 135 steam railways
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2. Other income	39,644,135	39,361,439	211,512,095	201,343,750
3. Total income	109,182,427	108,910,265	1,317,777,231	1,560,938,920
4. Miscellaneous deductions from income	6,513,924	12,644,687	41,499,826	41,020,569
5. Income available for fixed charges	102,668,503	96,265,578	1,276,277,405	1,519,918,351
6. Fixed charges:				
Rent for leased roads and equipment	13,379,932	9,108,186	159,122,453	166,588,842
Interest deductions[1]	35,069,288	34,420,414	405,224,686	428,355,427
Other deductions	203,277	254,882	1,607,781	1,616,657
Total fixed charges	48,652,497	43,783,482	565,954,920	596,560,926
7. Income after charges	54,016,006	52,482,096	710,322,485	923,357,425
8. Contingent charges	12,542,494	23,196,062	42,708,971	49,425,112
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11. Amortization of defense projects	18,899,496	16,895,826	191,048,743	145,581,666
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22. Temporary cash investments	1,828,461,780	1,577,912,221
23. Special deposits	224,681,488	226,755,675
24. Loans and bills receivable	349,084	215,429
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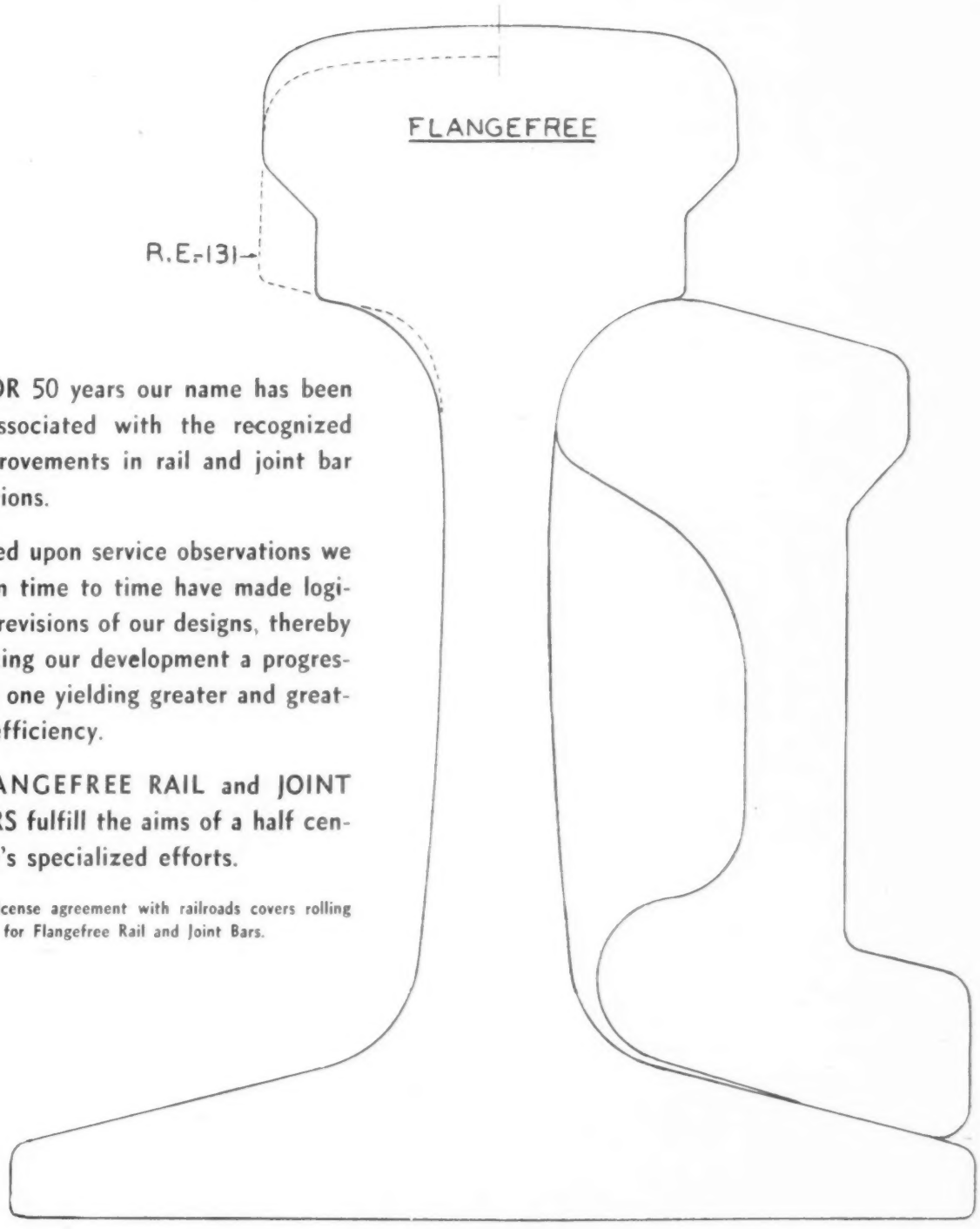

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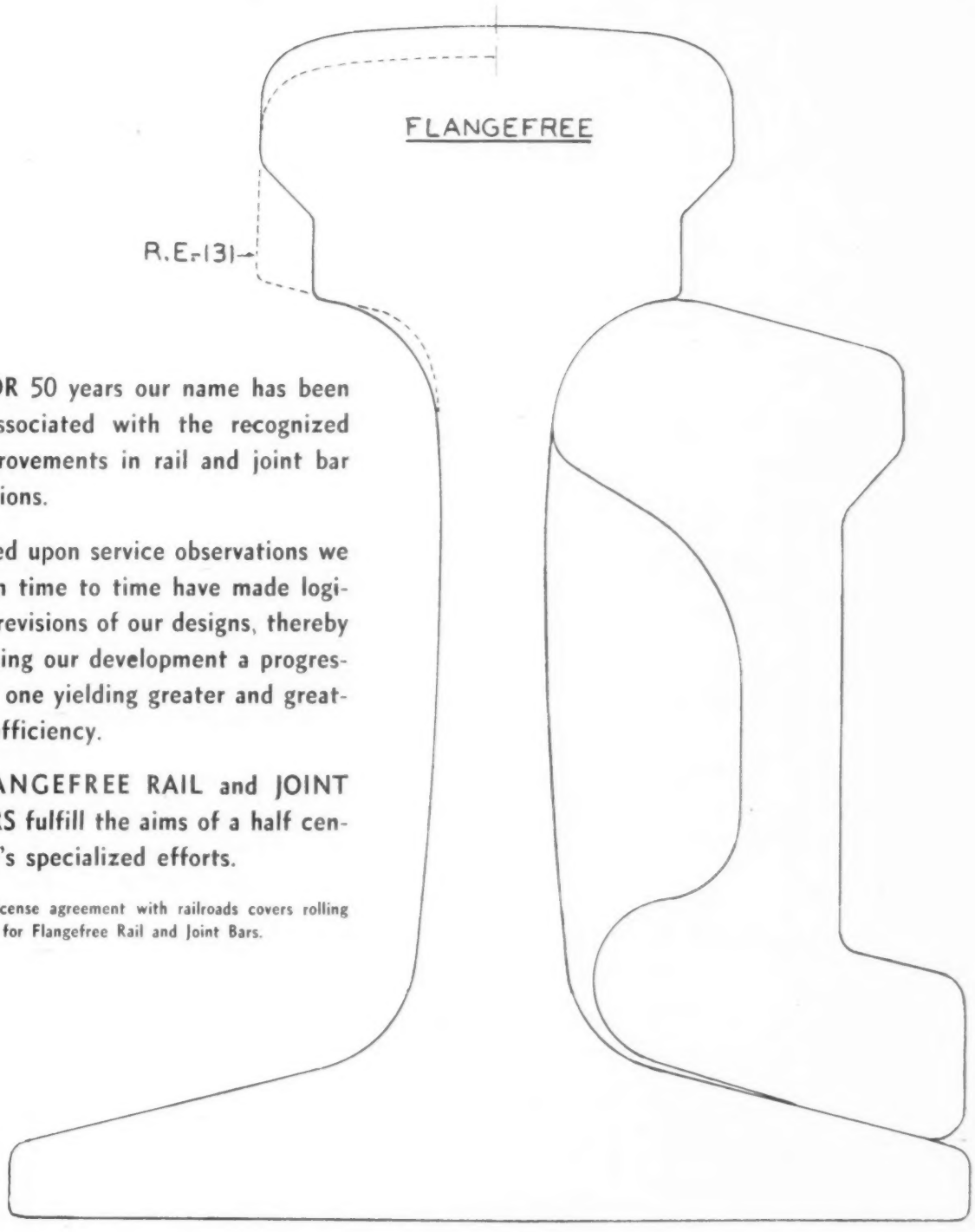

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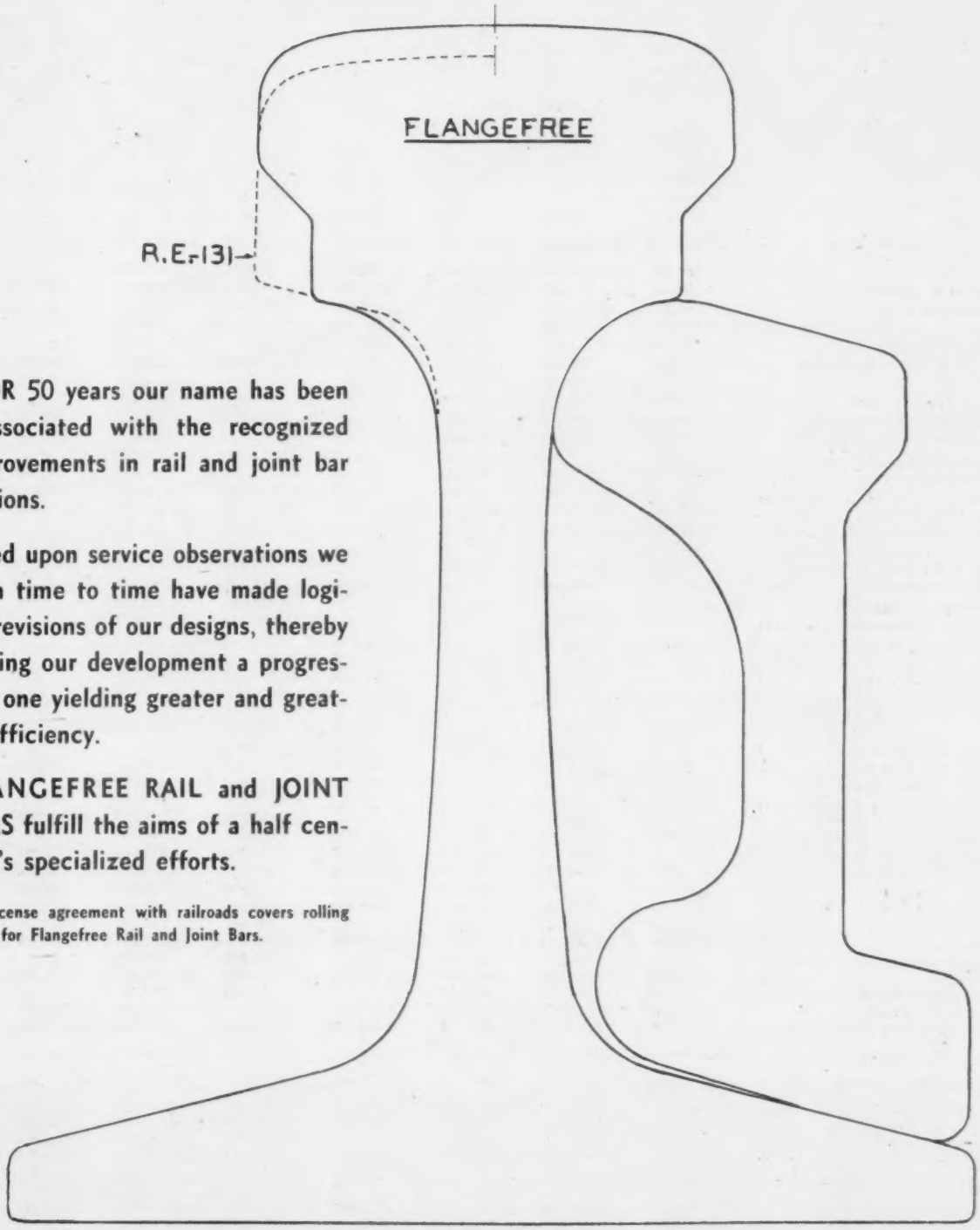

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THE THOMSON RAIL CORPORATION OF NEW YORK

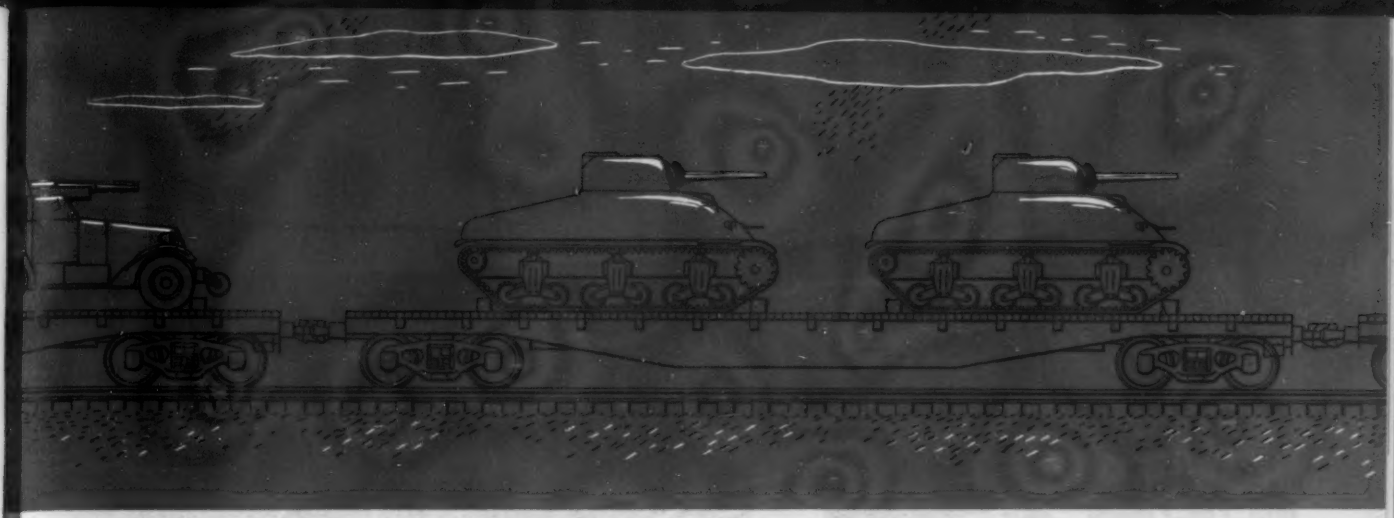
Pennsylvania Building, Philadelphia, Pa.

Selected Income Items by Regions and Districts, Class I Steam Railways, Calendar Year 1944 and 1943

Region and railway	Net Railway Operating Income		Net Income		Federal Income Taxes		Dividend Appropriations	
	1944	1943	1944	1943	1944	1943	1944	1943
United States—Total	$1,106,265,136	$1,359,595,170	$667,613,514	$873,932,313	$1,303,847,051	$1,335,250,635	$245,978,216	$216,293,694
Eastern District—Total	384,885,583	484,099,285	198,925,994	288,378,698	297,642,114	374,340,851	72,350,088	69,845,066
New England Region—Total	35,039,553	49,996,936	20,826,512	32,961,368	21,705,592	22,785,658	434,543	552,870
Bangor & Aroostock	1,455,316	1,790,160	947,421	1,221,745	1,980,371	1,263,390	334,950	334,950
Boston & Maine	10,094,131	11,877,358	5,644,556	7,142,072	3,366,921	5,534,701	.....	.....
Canadian National in New Eng.	*1,072,413	*1,243,546	*173	*3,167	.....	.....	.....	.....
Canadian Pacific in Maine	1,178,484	2,168,500	.....	.....	.....	.....	.....	.....
Canadian Pacific in Vermont	*1,029,904	*1,021,061	.....	.....	.....	.....	.....	.....
Central Vermont	828,024	1,460,293	*736,670	*142,916	163,060	134,954	.....	.....
Maine Central	1,880,732	2,346,408	715,232	1,124,487	1,292,028	1,232,098	99,593	217,920
New York Connecting	1,555,014	1,499,935	504,214	603,866	300,245	372,041	.....	.....
New York, New Haven & Hart.‡	20,146,318	30,791,940	14,071,121	22,901,437	14,602,967	14,248,474	.....	.....
Rutland‡	3,851	326,949	*319,189	113,844	.....	.....	.....	.....
Great Lakes Region—Total	149,158,416	197,166,486	74,239,400	125,524,823	116,513,289	160,460,507	23,054,819	23,570,951
Ann Arbor	665,324	773,990	423,121	508,565	334,055	640,702	.....	.....
Cambria & Indiana	652,469	575,069	625,071	541,388	839,041	692,557	540,000	510,000
Delaware & Hudson	8,848,260	11,132,460	3,965,465	8,004,630	1,091,000	.....	.....	.....
Delaware, Lackawanna & Western	6,420,112	11,181,280	87,181	4,688,759	1,161,759	4,400,986	.....	.....
Detroit & Mackinac	65,267	*56,742	*19,439	*147,709	.....	25,103	.....	.....
Detroit & Toledo Shore Line	693,529	681,936	582,775	619,419	560,145	550,488	600,000	690,008
Erie	16,324,332	19,807,690	8,223,369	10,280,265	11,825,517	17,555,304	4,472,819	4,460,811
Grand Trunk Western	5,383,576	6,712,043	1,139,260	2,455,025	513,667	1,534,443	.....	.....
Lehigh & Hudson River	288,421	284,349	313,898	309,784	334,065	381,052	94,140	188,280
Lehigh & New England	1,361,470	1,726,011	1,019,469	1,013,674	581,328	206,763	680,000	952,000
Lehigh Valley	7,828,292	13,477,689	772,120	6,633,008	1,412,234	4,969,802	.....	.....
Monongahela	1,238,428	1,215,284	744,392	717,234	722,624	821,190	374,700	374,700
Montour	758,310	674,685	743,326	646,983	529,442	510,977	306,000	408,000
New York Central[1]	65,759,085	88,524,297	35,789,939	62,734,050	50,933,112	74,697,279	9,671,091	9,671,091
New York, Chicago & St. Louis	11,290,714	13,265,201	7,225,924	9,188,026	18,739,000	22,500,000	.....	.....
New York, Ontario & Western‡	*989,092	209,089	*2,947,251	*1,210,459	.....	.....	.....	.....
New York, Susq. & Western‡	910,185	1,089,268	348,388	500,803	271,926	333,725	.....	.....
Pere Marquette	5,010,307	6,003,087	3,012,076	3,619,520	2,828,721	3,782,655	.....	.....
Pittsburgh & Lake Erie	5,216,975	5,873,225	4,488,301	4,360,906	5,538,050	6,160,180	4,318,250	4,318,250
Pittsburg & Shawmut	205,469	234,303	106,071	134,916	*27,274	94,575	.....	.....
Pittsburgh & West Virginia	2,056,080	1,883,294	1,550,863	1,420,713	106,426	295,773	.....	.....
Pittsburg, Shawmut & Northern†	*106,529	121,310	*255,504	*46,481	.....	.....	.....	.....
Wabash	9,277,432	11,777,668	6,300,585	8,551,804	18,218,451	20,306,953	1,997,819	1,997,819
Central Eastern Region—Total	200,687,614	236,935,863	103,860,062	129,892,507	159,423,233	191,094,686	48,860,726	45,721,245
Akron, Canton & Youngstown	692,090	975,585	438,335	241,131	320,101	413,345	220,380	.....
Baltimore & Ohio	41,648,378	52,167,469	12,857,503	11,357,783	28,909,468	28,619,769	.....	.....
Bessemer & Lake Erie	3,381,684	2,600,905	1,830,819	1,058,766	2,157,028	2,472,242	1,500,000	500,000
Central of New Jersey‡	4,496,492	5,190,600	217,932	712,860	734,522	1,210,000	.....	.....
Chicago & Eastern Illinois	2,930,241	3,397,266	1,463,571	1,846,422	2,777,896	3,569,500	767,726	939,375
Chicago & Illinois Midland	990,058	993,368	668,650	658,332	1,465,584	1,144,749	300,000	250,000
Chicago, Indianapolis & Louisville‡	2,415,936	2,909,831	819,558	1,535,475	653,619	526,128	.....	.....
Detroit, Toledo & Ironton	2,152,105	2,458,734	1,646,540	1,940,433	723,460	1,086,674	1,103,994	1,226,660
Elgin, Joliet & Eastern	3,124,532	1,946,923	2,399,740	1,239,635	3,056,050	2,797,500	3,820,000	1,400,000
Illinois Terminal	1,435,010	1,557,310	671,125	1,015,314	2,353,600	1,925,300	750,000	500,000
Long Island	2,813,649	3,736,092	983,280	2,993,419	564,158	1,107,218	.....	.....
Missouri-Illinois	569,213	449,727	520,480	443,617	580,841	785,000	.....	.....
Pennsylvania	108,972,066	127,546,411	64,720,431	85,418,484	91,698,071	120,367,830	32,919,385	32,519,385
Pennsylvania-Reading Seashore	418,992	843,339	*450,998	109,956	313,896	392,041	.....	.....
Reading	13,372,055	17,924,982	7,441,588	11,821,311	12,466,009	13,886,000	4,197,985	4,197,985
Staten Island Rapid Transit	916,740	1,028,583	289,245	.....	251,466	216,700	.....	.....
Western Maryland	7,005,936	7,464,076	4,120,860	4,509,440	4,266,464	3,634,690	1,241,947	1,241,947
Wheeling & Lake Erie	3,352,437	3,744,662	3,021,383	3,390,129	6,131,000	6,940,000	2,039,309	2,545,893
Southern District—Total	233,682,646	273,012,076	165,087,076	196,172,851	330,943,737	350,170,257	77,058,429	72,997,717
Pocahontas Region—Total	70,513,546	74,816,100	67,869,675	64,777,840	96,318,858	105,841,600	47,623,292	48,097,099
Chesapeake & Ohio	32,813,189	37,216,148	27,340,996	31,358,680	38,838,190	48,943,692	26,800,739	27,258,320
Norfolk & Western	25,943,534	24,908,875	30,747,522	22,807,569	41,580,000	39,728,725	14,946,154	14,957,183
Richmond, Fred. & Potomac	4,638,406	5,203,854	4,815,431	5,307,285	12,026,727	12,895,967	1,071,949	1,077,146
Virginian	7,118,417	7,487,223	4,965,726	5,304,306	3,873,941	4,273,216	4,804,450	4,804,450
Southern Region—Total	163,169,100	198,195,976	97,217,401	131,395,011	234,624,879	244,328,657	29,435,137	24,900,618
Alabama Great Southern	1,815,363	3,000,736	2,658,582	3,710,995	4,708,000	6,195,000	2,017,863	2,017,863
Atlanta & West Point	403,742	467,748	425,314	492,984	1,115,321	1,139,219	123,180	147,816
Atlanta, Birmingham & Coast	368,063	514,982	403,743	552,474	341,360	526,806	.....	.....
Atlantic Coast Line	13,672,457	15,704,857	16,101,393	17,480,959	35,675,000	42,500,000	2,480,117	2,480,117
Central of Georgia‡	6,397,292	7,345,556	1,201,164	1,940,663	1,799,332	5,694,782	.....	.....
Charleston & Western Carolina	712,397	800,097	436,148	520,336	570,000	585,000	144,000	144,000
Cincinnati, N. O. & Texas Pacific	4,914,310	6,440,820	3,261,813	4,700,164	8,461,000	8,994,000	3,710,670	3,710,670
Clinchfield	6,094,811	5,232,725	.....	.....	692,383	695,872	.....	.....

* Deficit or other reverse item.
† Report of receiver or receivers.
‡ Report of trustee or trustees.
[1] Includes Boston & Albany, lessor to New York Central.

Table continued on third right-hand page



2 problems - with the same answer

As long as the war lasts, the major problem of American railroads will be to move war-time traffic in the shortest possible time with the available equipment.

After the war, the problem will be two-fold—to compete in service with other means of transportation and to compete in cost with tax-favored forms of transportation.

"Union" C.T.C. greatly assists the solution of both the war-time and the post-war problems.

With "Union" Centralized Traffic Control, road delays are reduced to a minimum. One track with C.T.C. may do the work of two without C.T.C., hence, construction of additional tracks may often be avoided. In some cases, tracks now in service may be removed, with considerable saving in taxes and maintenance.

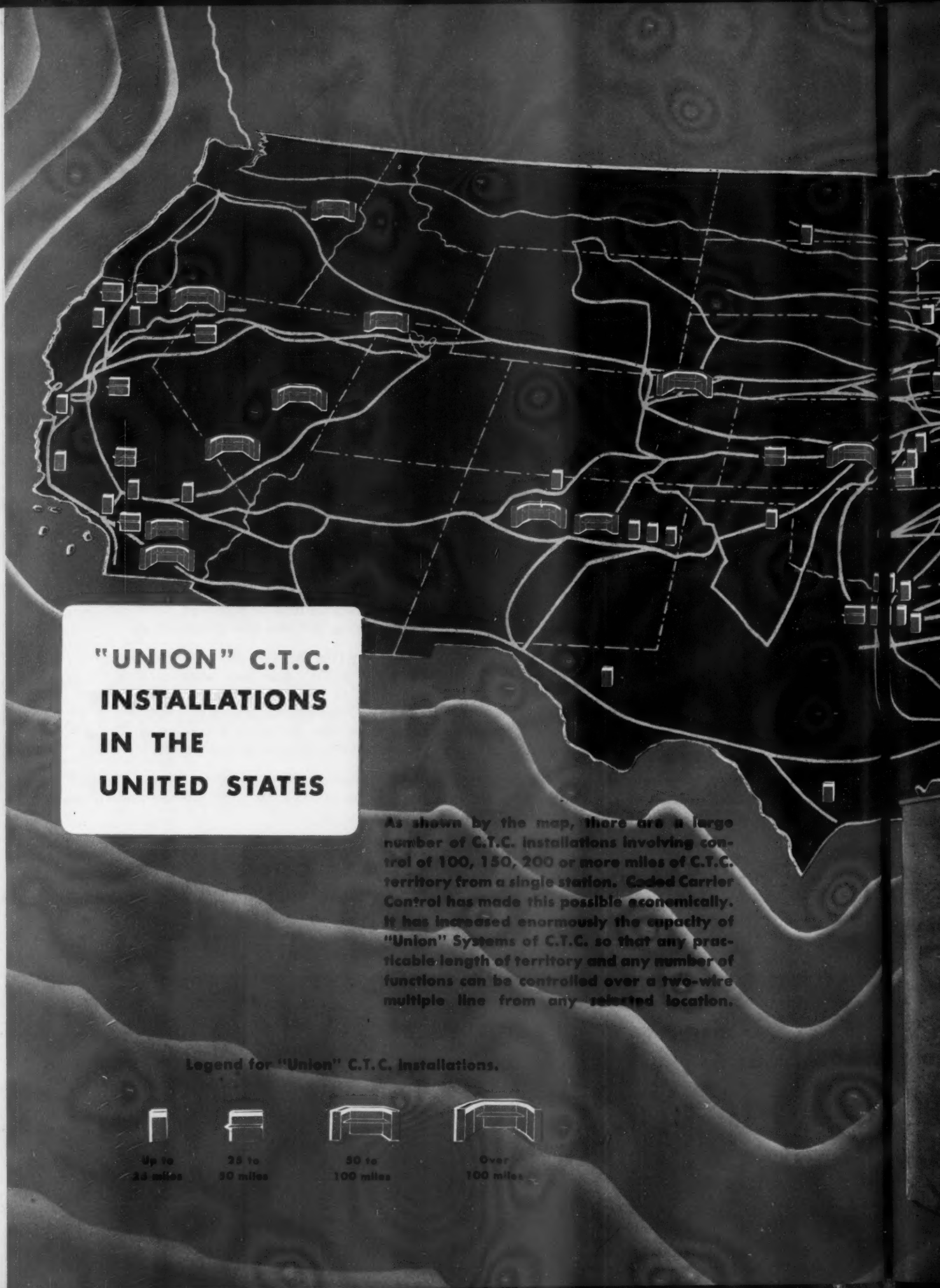
Consider this fact—*in the three war years more miles of C.T.C. have been installed than in the previous 15 years*—and this at a time of manpower and material scarcity, when every installation had to prove its value to the war effort before it could be authorized.

Our engineers will be glad to discuss "Union" C.T.C. in relation to your present and future needs.

UNION SWITCH & SIGNAL COMPANY

SWISSVALE PENNSYLVANIA

NEW YORK · CHICAGO · ST. LOUIS · SAN FRANCISCO

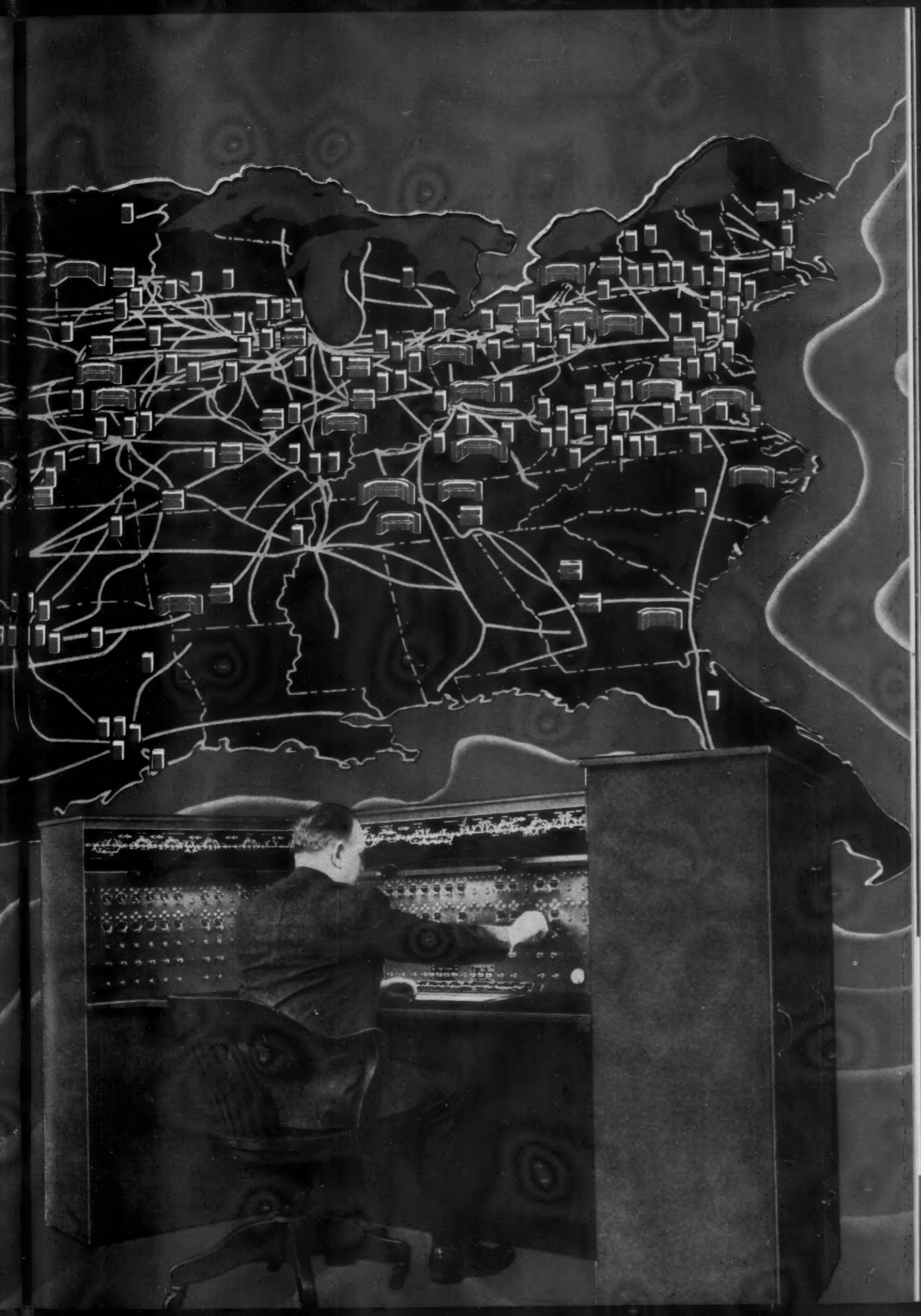


"UNION" C.T.C. INSTALLATIONS IN THE UNITED STATES

As shown by the map, there are a large number of C.T.C. installations involving control of 100, 150, 200 or more miles of C.T.C. territory from a single station. Coded Carrier Control has made this possible economically. It has increased enormously the capacity of "Union" Systems of C.T.C. so that any practicable length of territory and any number of functions can be controlled over a two-wire multiple line from any selected location.

Legend for "Union" C.T.C. installations.

Up to 25 miles | 25 to 50 miles | 50 to 100 miles | Over 100 miles



"UNION" C.T.C. INSTALLATIONS

"UNION" CENTRALIZED TRAFFIC CONTROL INSTALLATIONS IN SERVICE AND UNDER CONSTRUCTION JANUARY 1, 1945

Railroad	*Road Miles*	*Track Miles*
Atcheson, Topeka and Santa Fe	463.0	483.3
Atlantic Coast Line	4.0	4.0
Baltimore and Ohio	54.7	54.7
Bessemer and Lake Erie	49.9	88.6
Boston and Maine	81.4	122.3
Canadian Pacific	3.4	3.4
Central of Georgia	34.5	36.5
Central Railroad of New Jersey	4.4	17.6
Chesapeake and Ohio	226.7	269.1
Chicago, Burlington & Quincy	156.5	169.6
Chicago Great Western	1.5	1.5
Chicago, Milwaukee, St. Paul & Pacific	341.7	348.0
Chicago, Rock Island & Pacific	410.3	543.3
Duluth, Missabe & Iron Range	11.9	18.0
Erie	98.6	109.7
Illinois Central	41.1	61.0
Louisville & Nashville	199.0	199.0
Missouri-Kansas-Texas	15.0	15.0
Nashville, Chattanooga & St. Louis	257.5	261.5
New York, Chicago & St. Louis	132.5	137.5
New York, Ontario & Western	16.4	16.4
New York, Susquehanna & Western	1.5	1.5
Norfolk & Western	200.2	231.5
Pennsylvania	381.0	412.2
Pere Marquette	19.8	19.8
Pittsburgh & Lake Erie	3.1	6.3
Reading	1.4	2.7
St. Louis & San Francisco	123.1	129.9
St. Louis Southwestern	174.2	189.3
Seaboard Air Line	245.1	256.1
Southern Pacific	352.7	355.7
Texas & New Orleans	39.0	41.3
Union Pacific	372.5	376.4
Wabash	57.2	62.5
Western Pacific	115.0	115.0
	4689.8	5160.2

UNION SWITCH & SIGNAL COMPANY

SWISSVALE, PENNSYLVANIA

NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO

Selected Income Items by Regions and Districts, Class I Steam Railways, Calendar Year 1944 and 1943

Region and railway	Net Railway Operating Income		Net Income		Federal Income Taxes		Dividend Appropriations	
	1944	1943	1944	1943	1944	1943	1944	1943
Columbus & Greenville	$60,943	$54,183	$84,955	$73,915	$135,574	$29,650	.....	.....
Florida East Coast‡	5,951,599	10,173,479	1,633,487	4,954,411	4,403,885	3,369,975	.....	.....
Georgia—Lessee Organization	2,879,839	3,564,793	.....	.....	.....	.....	.....	.....
Georgia & Florida†	113,059	205,915	*668,542	*556,968	.....	.....	.....	.....
Georgia Southern & Florida	809,422	1,189,382	409,522	780,291	902,000	1,520,000	.....	.....
Gulf & Ship Island	257,959	*35,581	254,951	*64,018	.....	.....	.....	.....
Gul, Mobile & Ohio	4,624,909	5,918,935	3,218,150	4,328,169	2,989,644	2,806,900	$1,417,656	$1,417,176
Illinois Central	24,627,493	33,867,434	15,679,572	23,581,567	36,892,765	24,237,718	.....	.....
Louisville & Nashville	22,637,129	25,513,401	18,607,778	21,213,757	51,455,651	56,276,575	8,190,000	8,190,000
Mississippi Central	366,389	324,732	253,067	211,037	164,007	141,926	.....	.....
Nashville, Chattanooga & St. Louis	3,698,204	5,083,496	2,342,433	3,696,227	4,154,742	8,096,166	511,964	767,946
New Orleans & Northeastern	1,196,002	1,709,465	948,466	1,446,927	2,629,000	3,983,000	.....	.....
Norfolk Southern	682,845	943,296	304,413	507,342	220,437	364,587	60,037	118,630
Seaboard Air Line†	22,300,395	28,704,006	5,208,641	15,796,841	18,500,000	16,000,000	.....	.....
Southern	33,415,840	35,744,757	22,261,814	23,528,589	52,357,000	56,623,000	10,464,650	5,596,400
Tennessee Central	376,707	712,258	149,844	480,208	251,959	287,611	105,000	70,000
Western Railway of Alabama	523,357	659,911	486,357	618,976	1,093,561	1,194,472	210,000	240,000
Yazoo & Mississippi Valley	4,268,574	4,354,593	1,554,336	1,399,165	5,112,258	3,066,398	.....	.....
Western District—Total	487,696,907	602,483,809	303,600,444	389,380,764	675,261,200	610,739,527	96,569,699	73,450,911
Northwestern Region—Total	144,456,197	193,099,593	81,242,766	115,482,882	91,077,296	87,046,643	41,060,723	19,863,317
Chicago & North Western	23,086,701	40,791,747	16,108,061	26,149,889	15,995,000	1,200,000	22,372,055	.....
Chicago Great Western	3,357,724	3,723,331	2,380,024	2,705,827	1,919,500	4,209,000	915,279	1,372,899
Chicago, Milw., St. P. & Pacific‡	32,709,519	50,668,954	11,503,682	29,413,623	15,952,000	14,295,000	.....	.....
Chicago, St. P., Minn. & Omaha	3,453,622	3,898,532	1,072,223	1,453,270	567,000	786,000	.....	.....
Duluth, Missabe & Iron Range	9,335,449	9,531,111	8,329,545	8,652,841	8,371,878	9,558,080	9,253,125	10,281,250
Duluth, South Shore & Atlantic‡	642,680	1,000,744	*262,690	132,084	.....	.....	.....	.....
Duluth, Winnipeg & Pacific	180,909	395,871	*70	578	.....	.....	.....	.....
Great Northern	32,968,620	28,562,967	23,396,966	19,590,548	25,913,692	35,183,235	5,008,894	4,997,798
Green Bay & Western	175,111	562,841	65,851	491,446	220,389	184,759	125,000	125,000
Lake Superior & Ishpeming	678,450	670,998	688,645	676,782	472,118	408,467	535,500	535,500
Minneapolis & St. Louis	1,795,224	3,478,557	1,675,459	421,245	1,403,203	215,000	300,000	.....
Minneapolis, St. P.&S. Ste. Marie	8,481,985	8,398,092	1,038,308	*1,340,553	1,660,116	1,745,437	.....	.....
Northern Pacific	23,378,121	36,423,455	13,160,986	25,520,431	17,833,900	17,408,120	2,479,710	2,479,710
Spokane International	275,890	332,495	159,795	208,353	184,135	253,545	71,160	71,160
Spokane, Portland & Seattle	3,935,992	4,659,898	1,925,981	1,406,518	584,365	1,600,000	.....	.....
Central Western Region—Total	229,788,531	277,784,511	160,907,591	197,590,498	412,476,641	373,701,598	52,649,778	50,763,396
Alton‡	4,460,904	3,782,283	2,614,884	1,950,661	4,209,235	5,498,135	.....	.....
Atchison, Topeka & Santa Fe[2]	60,178,928	65,839,748	54,542,635	57,440,364	133,288,566	120,088,414	20,771,000	20,771,000
Chicago, Burlington & Quincy	32,074,823	35,762,487	24,647,122	28,231,264	43,335,722	44,028,670	5,125,161	5,125,161
Chicago, Rock Island & Pacific‡	26,079,689	36,794,983	10,451,128	24,438,832	33,500,000	21,100,000	.....	.....
Colorado & Southern	2,738,386	3,182,651	2,174,779	2,588,219	1,192,985	762,752	.....	.....
Colorado & Wyoming	344,787	331,342	265,853	259,919	74,700	209,246	.....	.....
Denver & Rio Grande Western‡	10,554,956	12,050,824	2,505,572	5,907,760	5,155,400	6,812,300	.....	.....
Denver & Salt Lake	874,663	630,665	1,813	4,106	1,667	339	.....	.....
Fort Worth & Denver City	2,974,141	3,972,146	2,052,198	2,692,006	*2,057,561	2,528,717	.....	.....
Northwestern Pacific	623,679	574,802	*719,546	*780,526	.....	.....	.....	.....
Southern Pacific	39,423,890	52,736,691	11,820,770	12,009,009	65,535,860	69,647,610	9,431,908	7,545,526
Southern Pacific System[3]	52,449,389	77,242,817	36,719,660	58,359,821	99,126,659	95,852,627	9,431,908	7,545,526
Toledo, Peoria & Western[4]	2,403,093	2,343,144	2,353,126	2,292,452	.....	.....	.....	.....
Union Pacific	36,526,015	41,205,855	41,070,895	45,293,259	118,000,000	103,000,000	17,321,709	17,321,709
Utah	196,971	145,473	113,412	57,752	*53,055	35,301	.....	.....
Western Pacific	10,333,606	18,431,417	7,012,950	15,205,421	6,178,000	*9,886	.....	.....
Southwestern Region—Total	113,452,179	131,599,705	61,450,087	76,307,384	171,707,263	149,991,286	2,859,198	2,824,198
Beaumont, Sour Lake & Western‡	848,417	1,413,619	745,339	1,262,322	4,534,276	2,649,433	.....	.....
Burlington-Rock Island	548,093	533,501	*62,299	*207,673	.....	.....	.....	.....
International-Great Northern‡	3,452,722	4,921,149	962,163	2,341,135	2,908,542	3,240,000	.....	.....
Kansas City Southern	6,450,047	4,989,139	4,418,162	2,848,533	6,230,000	6,990,000	420,000	420,000
Kansas, Oklahoma & Gulf	806,546	983,111	598,027	775,177	797,470	323,376	531,498	531,498
Louisiana & Arkansas	2,533,467	2,230,217	1,596,062	1,281,949	5,013,102	2,916,720	300,000	300,000
Midland Valley	226,727	412,936	79,995	150,189	29,995	.....	.....	.....
Missouri & Arkansas	131,080	34,649	89,999	27,256	103,593	7,717	35,000	.....
Missouri-Kansas-Texas	9,469,440	9,227,193	6,110,115	5,115,971	6,587,000	4,952,000	.....	.....
Missouri Pacific‡	34,309,050	34,574,379	17,684,236	16,591,415	47,500,000	49,000,000	.....	.....
New Orleans, Texas & Mexico‡	4,309,795	985,298	1,646,392	*1,702,673	1,004,197	4,990,556	.....	.....
Oklahoma City-Ada-Atoka	278,254	390,313	222,661	350,848	331,224	217,112	.....	.....
St. Louis, Brownsville & Mexico‡	1,951,311	2,573,727	1,251,801	1,904,403	5,208,284	4,934,909	.....	.....
St. Louis-San Francisco‡	17,336,113	22,488,529	5,657,481	10,667,728	12,495,000	7,871,000	.....	.....
St. Louis, San Francisco & Texas	367,343	1,097,518	256,588	919,679	763,000	703,000	.....	.....
St. Louis, Southwestern‡	10,807,120	10,677,148	8,119,085	7,543,273	22,670,794	17,873,286	.....	.....
San Antonio, Uvalde & Gulf‡	*479,960	*15,736	*689,263	*223,605	.....	.....	.....	.....
Texas & New Orleans	13,025,499	24,506,126	8,779,570	20,306,969	33,590,799	26,205,017	.....	.....
Texas & Pacific	6,757,274	9,244,887	3,821,791	6,155,859	21,829,987	16,838,435	1,572,700	1,572,700
Texas Mexican	323,841	332,002	162,182	198,629	110,000	278,725	.....	.....

[2] Includes Atchison, Topeka & Santa Fe, Gulf, Colorado & Santa Fe, and Panhandle & Santa Fe.
[3] Data not included in totals. Includes Southern Pacific Company, Texas & New Orleans, and leased lines.
[4] Operated by Federal Manager.
Compiled by the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. Subject to revision.

Freight Operating Statistics of Large Steam Railways—Selected

Region, road, and year		Miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (*thousands*)	Car-miles: Per cent loaded	Ton-miles (*thousands*): Gross excl. locos. & tenders	Ton-miles (*thousands*): Net-rev. and non-rev.	Road locos. on line: Serviceable: Unstored	Road locos. on line: Serviceable: Stored	Road locos. on line: B. O.	Road locos. on line: Per cent B. O.
New England Region:													
Boston & Albany	1944	362	168,868	197,501	41,932	4,199	67.9	262,076	112,745	69	..	24	25.8
	1943	362	162,258	199,364	32,648	4,096	59.8	278,922	114,418	79	..	15	16.0
Boston & Maine	1944	1,777	356,579	377,462	19,161	13,395	68.9	856,519	379,881	139	12	22	12.7
	1943	1,807	398,093	457,049	47,053	13,718	67.6	884,572	389,109	153	..	20	11.6
N. Y., New H. & Hartf.†	1944	1,815	481,051	598,277	57,836	17,674	69.7	1,062,636	463,448	214	11	31	16.6
	1943	1,815	544,335	665,144	59,456	18,960	68.6	1,176,807	525,357	234	1	34	15.9
Great Lakes Region:													
Delaware & Hudson	1944	846	315,546	383,277	36,219	13,218	68.1	920,214	480,096	129	62	35	15.5
	1943	848	333,807	416,771	36,367	14,223	67.5	1,001,641	524,626	151	37	33	14.9
Del., Lack. & Western	1944	971	393,032	464,592	75,581	15,500	67.6	1,030,350	477,024	149	16	40	19.5
	1943	971	472,180	445,219	75,381	16,249	69.1	1,072,885	512,914	155	11	33	16.6
Erie	1944	2,253	917,773	978,489	78,618	42,312	67.9	2,712,994	1,202,631	328	14	58	14.5
	1943	2,204	1,029,965	1,111,143	81,340	45,380	65.6	3,016,596	1,353,639	326	..	72	18.1
Grand Trunk Western	1944	1,026	274,964	283,217	2,519	8,197	67.6	525,159	233,354	67	1	11	13.9
	1943	1,026	273,587	288,812	2,529	8,368	69.5	535,979	245,437	73	2	8	9.6
Lehigh Valley	1944	1,247	495,622	544,782	70,216	20,316	61.7	1,434,281	671,120	155	..	12	7.2
	1943	1,248	504,585	559,449	82,719	20,293	62.4	1,444,453	690,360	154	..	13	7.8
New York Central	1944	10,325	3,582,832	3,844,180	246,190	128,612	64.8	8,845,706	4,163,226	1,112	14	275	19.6
	1943	10,326	3,872,341	4,165,309	266,914	141,134	62.0	10,041,582	4,678,574	1,212	8	210	14.7
New York, Chi. & St. L.	1944	1,656	801,775	816,846	12,704	31,104	69.4	1,987,716	913,721	178	5	22	10.7
	1943	1,657	865,802	883,389	11,428	32,134	67.4	2,100,896	959,834	161	..	16	9.0
Pere Marquette	1944	1,915	429,623	442,348	9,976	14,130	69.8	932,718	450,606	147	..	22	13.0
	1943	1,945	477,201	494,470	11,605	14,887	65.5	1,025,448	494,105	145	1	21	12.6
Pitts. & Lake Erie	1944	229	87,767	94,960	27	3,504	65.6	292,817	171,343	31	..	15	32.6
	1943	229	95,754	100,669	103	3,832	63.0	333,089	194,256	35	..	8	18.6
Wabash	1944	2,381	774,411	800,470	19,186	27,017	72.7	1,717,274	809,424	177	3	35	16.3
	1943	2,381	730,940	753,253	18,032	26,288	72.8	1,683,327	804,294	179	7	37	16.6
Central Eastern Region:													
Baltimore & Ohio	1944	6,106	2,268,798	2,780,904	285,642	74,069	66.0	5,227,967	2,587,735	938	4	214	18.5
	1943	6,109	2,415,157	2,970,525	298,530	77,826	63.1	5,663,253	2,778,038	950	1	196	17.1
Central of New Jersey†	1944	654	223,255	264,309	56,189	8,091	62.8	591,826	294,515	123	7	22	14.5
	1943	654	234,270	277,270	64,905	8,056	60.4	590,283	291,707	134	6	15	9.7
Chicago & Eastern Ill.	1944	912	267,988	273,123	8,298	7,843	63.0	545,248	255,230	75	..	6	7.4
	1943	912	326,388	335,418	11,724	9,439	57.8	692,813	311,436	80	..	6	7.0
Elgin, Joliet & Eastern	1944	392	136,078	140,948	4,611	3,785	64.8	299,305	162,034	62	..	14	18.4
	1943	392	131,933	136,014	3,615	3,581	64.3	285,991	154,961	60	..	16	21.1
Long Island	1944	372	35,024	36,400	16,497	363	56.1	25,990	10,717	47	..	4	7.8
	1943	372	35,833	37,179	14,520	371	55.4	28,106	11,942	43	..	6	12.2
Pennsylvania System	1944	9,868	4,434,447	5,138,489	714,812	160,407	64.7	11,109,518	5,297,665	2,013	..	214	9.6
	1943	9,914	4,598,284	5,372,655	698,314	171,561	63.6	12,220,911	5,936,202	2,000	..	175	8.0
Reading	1944	1,371	590,488	655,729	79,280	18,180	64.1	1,363,002	722,259	79	12	45	13.4
	1943	1,416	573,173	646,625	83,386	18,340	65.0	1,402,756	757,109	268	9	43	13.4
Pocahontas Region:													
Chesapeake & Ohio	1944	3,036	1,052,434	1,134,908	57,043	44,438	57.6	3,786,822	2,141,642	461	22	46	10.4
	1943	3,033	1,175,501	1,285,491	62,113	49,465	55.9	4,318,198	2,427,152	479	1	43	8.2
Norfolk & Western	1944	2,132	727,963	782,129	66,684	32,069	60.2	2,675,623	1,445,817	285	26	16	4.9
	1943	2,132	847,170	920,265	74,328	36,226	58.7	3,193,531	1,735,343	300	10	20	6.1
Southern Region:													
Atlantic Coast Line	1944	4,952	1,132,230	1,149,071	16,645	31,338	60.8	2,153,166	941,342	406	8	19	4.4
	1943	4,953	1,041,637	1,064,850	14,821	27,285	60.4	1,871,853	801,923	360	5	27	6.9
Central of Georgia†	1944	1,783	370,346	379,509	7,818	8,686	69.3	572,310	266,868	91	..	16	15.0
	1943	1,783	343,574	351,856	5,460	7,998	71.2	520,070	244,522	100	..	11	9.9
Gulf, Mobile & Ohio	1944	1,941	272,885	343,396	2,337	9,751	75.5	610,060	296,699	103	2	8	7.1
	1943	1,962	303,207	376,072	1,125	10,393	73.9	665,190	328,662	115	1	9	7.2
Illinois Central (incl. Yazoo & Miss. Vy.)	1944	6,347	1,641,419	1,598,018	31,758	61,083	64.4	4,234,392	2,005,707	636	1	56	8.1
	1943	6,347	1,737,805	1,752,461	32,164	64,427	63.7	4,525,985	2,145,071	627	..	67	9.7
Louisville & Nashville	1944	4,743	1,644,968	1,789,927	47,665	41,804	65.6	2,923,465	1,493,595	416	2	70	14.3
	1943	4,736	1,647,332	1,795,670	50,748	41,682	63.8	2,998,988	1,523,268	435	2	50	10.3
Seaboard Air Line*	1944	4,161	925,293	978,192	13,851	26,671	68.4	1,747,967	783,945	301	..	38	11.2
	1943	4,165	957,913	1,133,924	12,840	27,021	66.4	1,805,823	804,215	318	..	35	9.9
Southern	1944	6,471	2,110,170	2,154,095	40,334	46,981	69.7	2,988,580	1,380,810	609	..	98	13.9
	1943	6,479	2,241,218	2,288,951	34,365	49,684	68.3	3,234,348	1,502,870	606	..	86	12.4
Northwestern Region:													
Chi. & North Western	1944	8,069	1,044,853	1,095,022	25,615	32,907	71.0	2,177,820	1,020,117	362	11	114	23.4
	1943	8,098	1,074,271	1,133,489	26,603	33,655	68.7	2,251,895	1,060,132	385	22	97	19.2
Chicago Great Western	1944	1,445	284,990	288,452	9,026	8,570	72.4	550,233	250,007	66	..	10	13.2
	1943	1,445	297,224	302,937	13,336	9,255	71.6	608,513	282,034	73	..	7	8.8
Chi., Milw., St. P. & Pac.†	1944	10,715	1,601,580	1,717,479	86,034	55,236	68.9	3,653,049	1,747,721	514	39	71	11.4
	1943	10,734	1,559,966	1,660,439	75,587	51,017	70.2	3,376,769	1,649,313	524	44	68	10.7
Chi., St. P., Minneap. & Om.	1944	1,606	221,629	239,779	13,654	5,807	69.2	395,325	190,215	96	19	15	11.5
	1943	1,606	227,845	244,298	13,572	5,826	70.0	394,386	185,502	95	29	6	4.6
Duluth, Missabe & I. R.	1944	546	23,385	23,657	648	364	65.2	23,167	11,573	22	14	25	41.0
	1943	544	40,055	40,098	1,959	1,202	56.3	94,063	53,426	24	9	17	34.0
Great Northern	1944	8,276	1,230,308	1,230,227	53,734	45,519	70.6	3,032,276	1,447,323	422	19	44	9.1
	1943	8,278	1,303,422	1,308,052	56,891	45,418	70.2	3,112,618	1,520,543	410	13	55	11.5
Min., St. P. & S. St. M.	1944	4,259	425,135	436,907	7,613	10,920	65.5	743,105	347,794	119	6	6	4.6
	1943	4,258	502,095	519,313	10,372	12,716	68.0	871,557	427,053	136	3	7	4.8
Northern Pacific	1944	6,570	969,740	1,039,759	81,744	39,720	73.6	2,655,280	1,335,190	387	12	54	11.9
	1943	6,571	987,975	1,058,163	84,863	39,573	75.7	2,652,531	1,394,663	381	16	47	10.6
Central Western Region:													
Alton†	1944	915	277,604	290,984	1,401	7,158	70.2	470,425	232,718	74	..	5	6.3
	1943	915	268,957	288,580	1,636	6,896	67.5	458,747	223,828	69	..	6	8.0
Atch., Top. & S. Fe (incl. G. C. & S. F. & P. & S. F.)	1944	13,092	3,531,571	3,766,234	212,933	126,220	66.6	8,284,596	3,419,995	912	5	88	8.8
	1943	13,147	3,025,568	3,258,584	204,635	100,569	66.1	6,816,813	2,841,774	839	..	108	11.4
Chi., Burl. & Quincy	1944	8,790	1,450,586	1,523,934	54,129	54,197	67.6	3,695,631	1,767,721	502	..	62	11.0
	1943	8,827	1,501,913	1,590,589	56,641	53,632	67.2	3,691,850	1,772,657	485	..	59	10.8
Chi., Rock I. & Pac.†	1944	7,717	1,410,170	1,470,375	13,067	41,740	68.6	2,701,475	1,221,941	387	..	77	16.6
	1943	7,718	1,361,385	1,403,607	14,928	39,452	67.6	2,601,599	1,175,350	395	..	73	15.6
Denver & R. G. Wn.†	1944	2,386	455,495	511,186	74,107	16,076	77.4	1,029,398	520,802	173	4	33	15.7
	1943	2,399	466,294	538,123	88,356	16,239	79.1	1,011,735	513,367	177	..	34	17.7
Southern Pacific—Pac. Lines	1944	8,179	2,192,630	2,486,989	391,941	94,200	70.7	5,994,846	2,615,275	783	..	155	16.5
	1943	8,194	2,223,610	2,519,877	372,881	93,345	71.4	5,952,735	2,641,526	803	4	108	11.8
Union Pacific	1944	9,781	3,168,038	3,390,704	290,418	118,302	69.8	7,681,619	3,874,774	843	5	61	6.7
	1943	9,782	3,057,514	3,245,973	273,293	110,201	70.6	7,163,215	3,681,237	825	..	63	7.1
Southwestern Region:													
Mo.-Kans.-Texas Lines	1944	3,241	852,442	884,448	16,119	22,608	61.5	1,550,142	697,264	159	..	15	8.6
	1943	3,281	824,133	853,927	14,901	21,633	61.2	1,492,036	665,133	155	..	17	9.9
Missouri Pacific†	1944	7,056	1,693,685	1,777,830	47,804	58,861	67.9	3,929,591	1,825,748	463	..	67	12.6
	1943	7,071	1,843,302	1,912,970	47,721	61,119	64.6	4,258,181	1,979,773	471	1	73	13.4
Texas & Pacific	1944	1,882	435,704	435,704	7,505	15,025	68.5	970,433	411,207	135	9	14	8.9
	1943	1,882	446,991	446,991	8,377	15,009	65.6	996,216	421,637	115	15	13	9.1
St. Louis-San Francisco†	1944	4,616	1,122,922	1,192,756	24,482	26,457	67.9	1,735,971	796,181	323	..	27	7.7
	1943	4,635	1,053,749	1,118,199	24,047	25,030	65.3	1,689,347	777,264	342	..	21	5.8
St. Louis-San Fran. & Texas	1944	159	35,976	37,078	..	547	74.4	34,611	14,519	8	..	..	..
	1943	159	36,038	37,212	56	577	65.6	38,480	16,481	9	..	1	10.0
St. Louis Southw. Lines†	1944	1,600	518,460	528,774	7,072	18,633	70.9	1,168,638	534,458	112	4	23	16.5
	1943	1,600	564,437	578,314	8,044	18,630	68.4	1,187,966	513,943	117	2	24	16.8
Texas & New Orleans	1944	4,331	1,176,723	1,179,736	45,204	30,711	65.3	2,065,242	914,000	257	..	24	8.5
	1943	4,339	1,197,839	1,205,675	37,638	32,014	64.8	2,167,073	958,648	261	..	22	7.8

* Report of receivers.
† Report of trustee or trustees.

Items for the Month of December 1944 Compared with December 1943

Region, road, and year		Freight cars on line: Home	Foreign	Total	Per Cent B. O.	G.t.m. per train-hr. excl. locos. and tenders	G.t.m. per train-mi. excl. locos. and tenders	Net ton-mi. per train-mile	Net ton-mi. per l'd. car-mile	Net ton-mi. per car-day	Car miles per car-day	Net daily ton-mi. per road-mi.	Coal lb. per 1000 g.t.m. inc. loco.	Mi. per loco. per day
New England Region:														
Boston & Albany	1944	298	6,832	7,150	0.3	21,508	1,565	673	26.9	550	30.2	10,047	230	92.0
	1943	310	7,628	7,938	0.2	21,582	1,725	708	27.9	532	31.9	10,196	206	92.1
Boston & Maine	1944	2,197	11,299	13,496	4.2	37,318	2,411	1,069	28.4	916	46.9	6,896	113	78.0
	1943	2,095	11,030	13,125	2.6	32,856	2,229	980	28.4	945	49.2	6,946	103	98.0
N. Y., New H. & Hartf.†	1944	2,433	22,202	24,635	3.0	31,759	2,246	980	26.2	627	34.3	8,237	107	83.3
	1943	3,034	22,359	25,393	2.5	31,108	2,196	981	27.7	652	34.3	9,337	112	93.4
Great Lakes Region:														
Delaware & Hudson	1944	3,764	5,403	9,167	3.4	49,196	2,934	1,531	36.3	1,753	70.9	18,306	119	63.1
	1943	3,422	5,917	9,339	1.8	47,997	3,016	1,580	36.9	1,778	71.4	19,957	115	69.7
Del., Lack. & Western	1944	6,151	14,675	20,826	2.8	36,868	2,647	1,226	30.8	763	36.7	15,847	140	91.6
	1943	5,785	12,762	18,547	2.9	40,994	2,914	1,393	31.6	895	41.0	17,040	136	89.6
Erie	1944	10,418	29,177	39,595	3.0	49,202	2,976	1,319	28.4	1,031	53.4	17,296	110	91.9
	1943	10,913	28,251	39,164	2.2	47,731	2,941	1,320	29.8	1,129	57.7	19,459	109	103.8
Grand Trunk Western	1944	2,750	7,235	9,845	3.8	39,888	1,929	857	28.5	754	39.2	7,337	95	126.9
	1943	2,289	5,655	7,944	3.7	40,675	1,970	902	29.3	959	47.0	7,717	102	119.7
Lehigh Valley	1944	7,558	22,666	30,224	1.9	45,287	2,982	1,395	33.0	739	36.2	17,361	128	124.7
	1943	6,520	20,842	27,362	1.7	46,995	2,978	1,423	34.0	841	39.6	17,844	120	130.1
New York Central	1944	47,109	105,320	152,429	3.1	36,350	2,510	1,182	32.4	931	44.3	13,007	120	104.8
	1943	45,910	123,941	169,851	2.5	37,790	2,633	1,227	33.1	940	45.7	14,616	114	110.8
New York, Chi. & St. L.	1944	2,431	15,853	18,284	2.1	42,412	2,504	1,151	29.4	1,732	85.0	17,799	101	135.5
	1943	2,594	12,925	15,519	1.9	43,791	2,445	1,117	29.9	1,929	95.7	18,686	97	171.9
Pere Marquette	1944	2,276	8,974	11,250	2.7	37,756	2,200	1,063	31.9	1,248	56.1	7,590	106	92.0
	1943	2,499	7,568	10,067	2.7	37,741	2,183	1,052	33.2	1,414	65.1	8,195	98	105.2
Pitts. & Lake Erie	1944	3,907	8,677	12,585	4.3	42,394	3,347	1,958	48.9	435	13.6	24,136	112	71.4
	1943	2,833	8,487	11,320	3.5	47,080	3,484	2,032	50.4	488	15.4	27,364	102	75.7
Wabash	1944	6,190	12,832	19,022	3.2	43,079	2,247	1,059	30.0	1,419	65.1	10,966	122	127.2
	1943	6,012	11,706	17,718	1.7	43,625	2,323	1,110	30.6	1,514	68.0	10,897	115	116.3
Central Eastern Region:														
Baltimore & Ohio	1944	39,172	49,841	89,013	3.6	27,466	2,357	1,167	34.9	897	38.9	13,671	170	88.3
	1943	37,392	56,293	93,685	3.0	27,008	2,402	1,178	35.7	913	40.6	14,669	166	97.0
Central of New Jersey†	1944	5,171	14,171	19,342	4.2	31,791	2,655	1,321	36.4	484	21.1	14,527	144	86.1
	1943	4,484	21,800	26,284	1.7	27,071	2,551	1,261	36.2	358	16.4	14,388	159	95.3
Chicago & Eastern Ill.	1944	2,190	3,930	6,120	4.1	34,562	2,104	985	32.5	1,262	61.5	9,028	130	115.3
	1943	2,092	5,940	8,032	3.0	35,026	2,184	982	33.0	1,274	66.8	11,016	124	133.8
Elgin, Joliet & Eastern	1944	8,519	7,198	15,717	2.6	15,398	2,341	1,267	42.8	333	12.0	13,334	166	94.4
	1943	8,979	6,808	15,787	3.4	16,422	2,279	1,235	43.3	310	11.1	12,752	147	88.9
Long Island	1944	38	5,300	5,338	.4	6,501	758	312	29.5	61	3.7	929	346	48.2
	1943	42	4,465	4,507	.7	6,074	801	340	32.2	81	4.5	1,036	320	49.0
Pennsylvania System	1944	119,593	126,959	246,552	3.4	33,099	2,590	1,235	33.0	697	32.6	17,318	145	92.1
	1943	123,738	126,008	249,766	2.7	33,879	2,745	1,333	34.6	780	35.4	19,315	140	98.0
Reading	1944	13,342	21,362	34,704	2.3	29,208	2,310	1,224	39.7	638	25.0	16,994	138	81.8
	1943	11,638	27,868	39,506	1.5	28,480	2,453	1,324	41.3	645	24.0	17,248	138	82.2
Pocahontas Region:														
Chesapeake & Ohio	1944	39,432	14,170	53,602	1.9	50,646	3,655	2,067	48.2	1,299	46.8	22,755	93	78.8
	1943	33,753	15,784	49,537	.9	49,315	3,755	2,111	49.1	1,514	55.3	25,814	92	93.0
Norfolk & Western	1944	32,532	6,483	39,017	1.2	57,532	3,752	2,027	45.1	1,204	44.4	21,876	106	89.4
	1943	34,160	7,081	41,241	1.3	57,776	3,846	2,090	47.9	1,402	49.8	26,256	103	105.5
Southern Region:														
Atlantic Coast Line	1944	8,471	24,382	32,853	1.4	29,292	1,915	837	30.0	973	53.3	6,132	108	93.1
	1943	8,253	23,131	31,384	2.6	27,762	1,811	776	29.4	844	47.5	5,223	124	95.5
Central of Georgia†	1944	2,212	6,642	8,854	1.1	29,298	1,571	733	30.7	988	46.4	4,828	148	124.1
	1943	1,680	6,402	8,082	1.4	28,151	1,522	716	30.6	927	42.6	4,424	131	112.5
Gulf, Mobile & Ohio	1944	1,903	6,854	8,757	.6	38,996	2,239	1,089	30.4	1,017	44.3	4,931	124	100.9
	1943	2,192	6,590	8,782	.5	38,479	2,203	1,088	31.6	1,149	49.1	5,404	120	102.6
Illinois Central (incl. Yazoo & Miss. Vy.)	1944	20,034	30,786	50,820	.9	41,717	2,647	1,254	32.8	1,216	57.5	10,194	133	81.4
	1943	19,919	34,723	54,642	.6	42,114	2,673	1,267	33.3	1,320	62.3	10,902	128	87.2
Louisville & Nashville	1944	31,132	14,928	46,060	3.3	27,088	1,777	908	33.7	1,072	45.7	10,158	148	126.2
	1943	31,270	16,104	47,374	2.1	25,661	1,821	925	36.5	1,070	45.9	10,375	145	128.9
Seaboard Air Line*	1944	6,669	19,368	26,037	1.9	31,763	1,931	866	29.4	994	49.5	6,078	130	104.6
	1943	6,695	21,350	28,045	1.0	29,821	1,919	855	29.8	959	48.5	6,229	127	114.8
Southern	1944	16,117	33,082	49,199	2.7	22,898	1,437	664	29.4	897	43.8	6,883	166	106.0
	1943	15,625	30,249	45,874	1.7	24,001	1,467	682	30.2	1,059	51.3	7,482	154	114.3
Northwestern Region:														
Chi. & North Western	1944	21,193	30,831	52,024	4.0	33,107	2,160	1,012	31.0	629	28.6	4,078	141	80.6
	1943	20,717	33,680	54,397	4.1	32,867	2,170	1,022	31.5	651	30.1	4,223	133	79.7
Chicago Great Western	1944	886	3,989	4,875	2.2	33,811	1,958	890	29.2	1,598	75.6	5,581	143	128.3
	1943	907	4,629	5,536	.7	36,399	2,054	952	30.5	1,659	76.0	6,296	133	130.8
Chi., Milw., St. P. & Pac.†	1944	21,593	32,919	54,512	2.0	36,237	2,299	1,100	31.6	1,063	48.7	5,262	130	100.3
	1943	21,899	28,477	50,376	1.4	33,702	2,179	1,064	32.3	1,053	46.4	4,957	131	95.2
Chi., St. P., Minneap. & Om.	1944	808	6,296	7,104	5.4	25,803	1,845	888	32.8	875	38.6	3,821	119	65.3
	1943	1,071	6,668	7,739	5.7	25,293	1,793	844	31.8	757	34.0	3,726	118	68.8
Duluth, Missabe & I. R.	1944	15,156	406	15,562	3.7	14,161	1,044	521	31.8	24	1.2	684	172	17.3
	1943	15,051	396	15,447	2.6	37,944	2,464	1,399	44.4	112	4.5	3,168	97	30.8
Great Northern	1944	20,283	17,656	37,939	1.8	37,774	2,482	1,184	31.8	1,180	52.5	5,641	115	90.9
	1943	21,242	14,742	35,984	2.6	36,324	2,412	1,178	33.5	1,252	53.3	5,925	115	99.1
Min., St. P. & S. St. M.†	1944	5,533	6,422	11,955	2.6	30,949	1,753	821	31.8	879	42.1	2,634	109	108.0
	1943	5,743	7,549	13,292	2.8	31,129	1,781	873	33.6	1,054	46.2	3,235	107	119.1
Northern Pacific	1944	13,828	21,149	34,977	2.8	41,257	2,752	1,384	33.6	1,236	50.0	6,556	142	86.6
	1943	16,090	14,937	31,027	3.2	40,687	2,694	1,416	35.2	1,394	52.3	6,847	133	90.1
Central Western Region:														
Alton†	1944	1,327	7,050	8,377	2.0	25,164	1,721	851	32.5	884	38.8	8,204	145	122.8
	1943	840	7,144	7,984	2.7	36,735	1,718	838	32.5	907	41.5	7,891	136	133.7
Atch., Top. & S. Fe (incl. G. C. & S. F. & P. & S. F.)	1944	41,461	54,948	96,409	2.5	41,739	2,367	977	27.1	1,114	61.7	8,427	123	133.4
	1943	43,524	43,551	87,075	2.3	39,074	2,272	947	28.3	1,045	55.9	6,973	126	124.2
Chi., Burl. & Quincy	1944	15,850	27,384	43,234	2.6	40,762	2,560	1,225	32.6	1,227	55.6	6,487	124	96.7
	1943	15,346	28,648	43,994	2.0	39,024	2,473	1,187	33.1	1,323	59.5	6,478	116	104.2
Chi., Rock I. & Pac.†	1944	9,126	24,221	33,347	4.6	34,256	1,930	873	29.3	1,169	58.2	5,108	125	106.9
	1943	10,344	20,435	30,779	3.6	33,017	1,919	867	29.8	1,216	60.4	4,912	124	102.6
Denver & R. G. Wn.†	1944	7,660	6,701	14,361	4.2	35,176	2,283	1,155	32.4	1,083	43.2	7,041	182	90.8
	1943	8,215	7,689	15,904	2.9	30,371	2,210	1,121	31.6	994	39.7	6,903	185	98.4
Southern Pacific—Pac. Lines	1944	22,952	58,171	81,123	2.1	36,728	2,759	1,204	27.8	996	50.8	10,315	108	103.9
	1943	25,672	63,006	88,678	2.0	36,431	2,699	1,198	28.3	958	47.4	10,399	109	106.6
Union Pacific	1944	25,783	40,753	67,576	2.2	45,491	2,451	1,237	32.8	1,797	78.6	12,779	131	132.7
	1943	26,295	40,422	66,717	2.2	42,883	2,376	1,221	33.4	1,733	73.5	12,140	132	130.9
Southwestern Region:														
Mo.-Kans.-Texas Lines	1944	1,283	10,256	11,539	.3	33,401	1,826	821	30.8	2,132	112.3	6,940	96	176.7
	1943	2,107	7,683	9,790	1.2	32,927	1,819	811	30.7	2,211	117.4	6,539	98	168.3
Missouri Pacific†	1944	13,499	27,266	40,765	1.1	38,878	2,338	1,086	31.0	1,444	68.5	8,347	120	117.1
	1943	11,138	30,998	42,136	1.3	38,561	2,323	1,080	32.4	1,508	72.1	9,032	113	123.0
Texas & Pacific	1944	1,754	6,675	8,429	1.3	39,860	2,241	950	27.4	1,547	82.5	7,048	97	99.1
	1943	2,203	6,425	8,628	1.0	38,343	2,244	950	28.1	1,558	84.5	7,227	96	111.3
St. Louis-San Francisco†	1944	7,302	11,764	19,066	2.0	30,301	1,556	714	30.1	1,301	63.7	5,564	152	116.9
	1943	7,634	10,381	18,015	2.2	31,285	1,609	740	31.1	1,356	66.8	5,409	146	105.7
St. Louis-San Fran. & Texas	1944	..	303	303	2.0	19,444	970	407	26.5	1,725	87.3	2,946	134	151.7
	1943	..	373	373	7.8	21,073	1,071	459	28.6	1,477	78.8	3,344	131	123.0
St. Louis Southw. Lines†	1944	..	7,709	8,795	1.1	35,963	2,258	1,033	28.7	1,954	96.1	10,775	90	130.4
	1943	1,262	5,705	6,967	.8	33,873	2,113	914	27.6	2,181	115.6	10,362	89	138.1
Texas & New Orleans	1944	3,962	17,854	21,816	2.4	30,890	1,772	784	29.8	1,359	69.9	6,808	99	145.9
	1943	4,331	18,108	22,439	2.0	31.380	1,832	810	29.9	1,272	65.6	7,127	94	145.9

Compiled by the Bureau of Transport Economics and Statistics, Interstate Commerce Commision. Subject to revision.

THIS Air throttle feature

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Air has an important new job in these modern Diesel-Electric locomotives. It's been stopping trains for over 75 years—here it helps to *run* them, too.

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Diesel-Electrics

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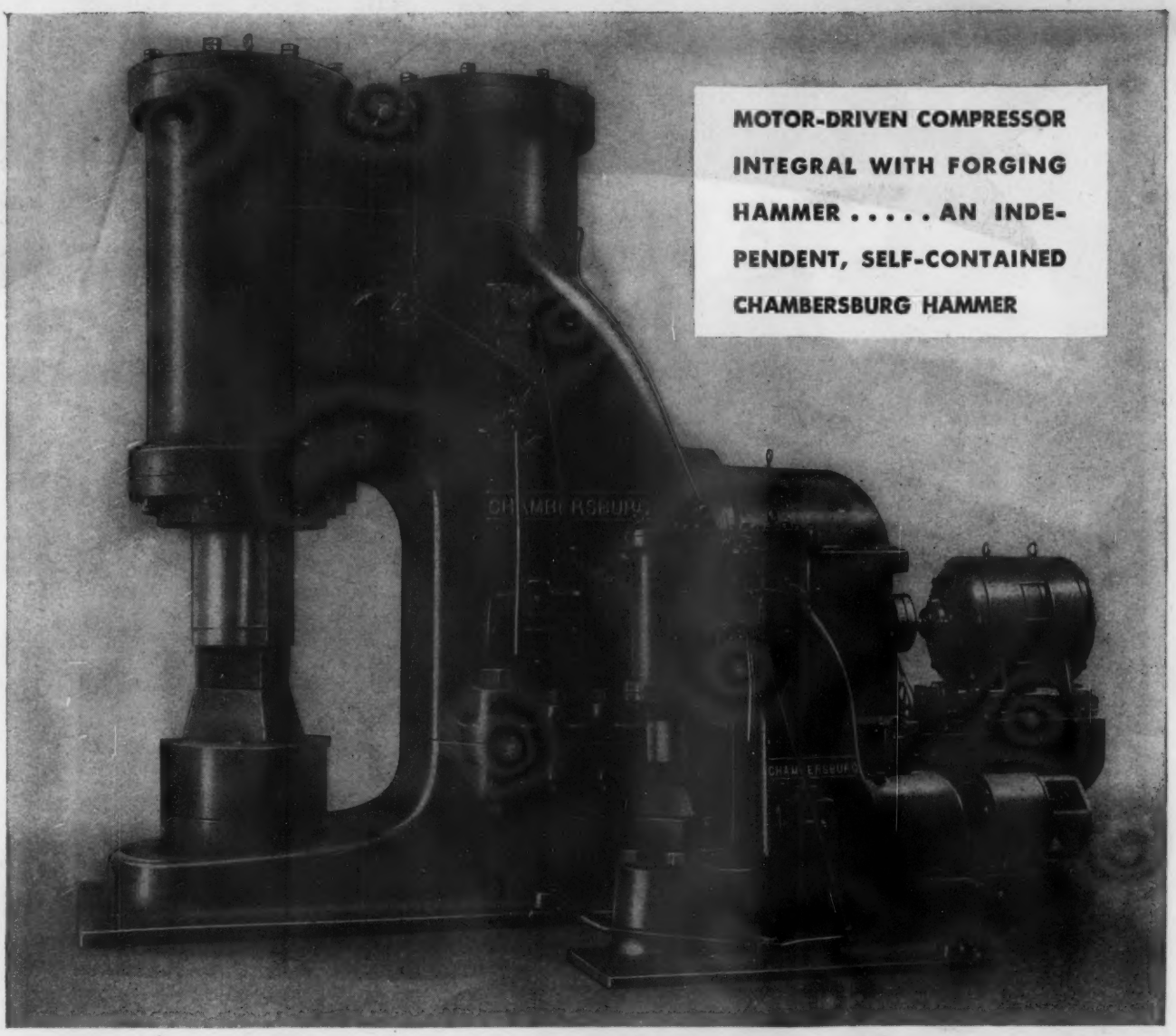
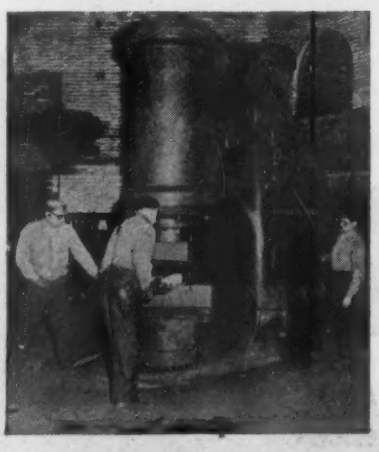


MOTOR-DRIVEN COMPRESSOR INTEGRAL WITH FORGING HAMMER . . . . . AN INDEPENDENT, SELF-CONTAINED CHAMBERSBURG HAMMER



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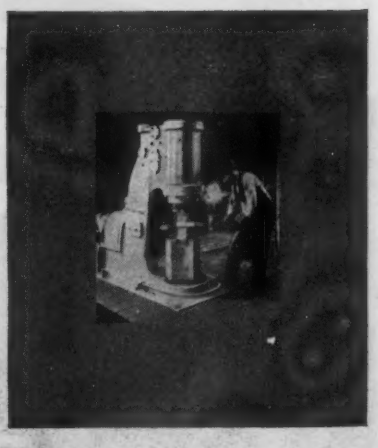

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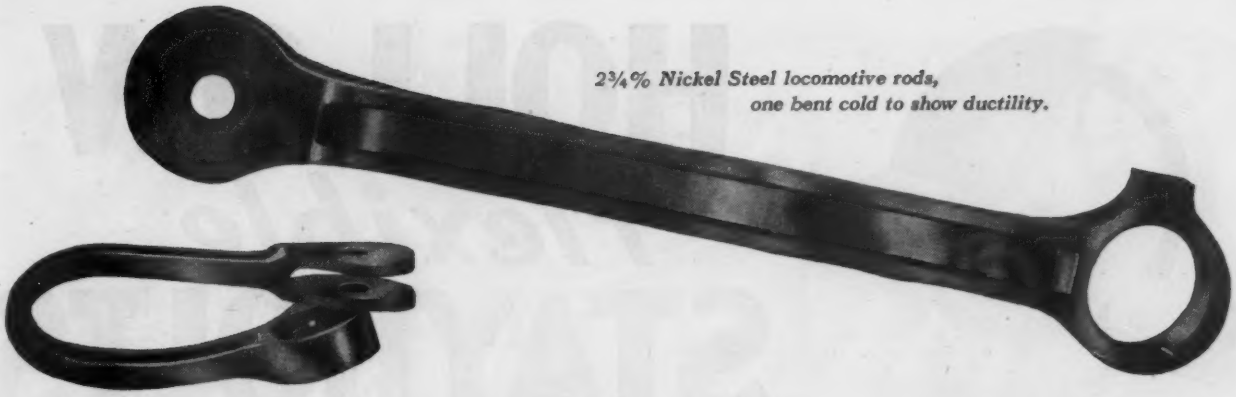

2¾% Nickel Steel locomotive rods, one bent cold to show ductility.

QUENCHED AND TEMPERED

NICKEL STEEL

FORGINGS COMBINE

EXCEPTIONAL DUCTILITY WITH HIGH TENSILE STRENGTH

Composition and Typical Properties of Normalized Quenched and Tempered 2¾% Nickel Steel Rods

Description or Size	Melt Yield Pt. No. #s per Sq. In.	Tensile Strength #s per Sq. In.	Elong. % in 2 In.	Reduction in Area %	ANALYSIS					
					Car.	Mang.	Phos.	Sul.	Sil.	Ni
Main Rod....	92900	110000	25.0	64.4	.31	.78	.027	.026	.25	2.75
Main Rod....	86500	104500	25.5	65.6	.32	.86	.034	.032	.29	2.69
Main Rod....	86360	104400	26.0	64.8	.32	.86	.034	.032	.29	2.69
Main Rod....	87850	102350	26.0	66.2	.31	.89	.037	.025	.32	2.69
Front Rod....	86000	102250	25.0	67.3	.29	.82	.035	.027	.24	2.71
Front Rod....	83900	104250	25.0	66.1	.29	.82	.035	.027	.24	2.71
Front Rod....	86850	104250	27.0	66.1	.32	.86	.035	.025	.30	2.65
Front Rod....	89500	107050	25.5	65.6	.32	.86	.035	.025	.30	2.65
Back Rod....	89500	107650	25.0	62.7	.30	.79	.030	.025	.22	2.71
Back Rod....	87500	106450	25.0	65.4	.29	.82	.035	.027	.24	2.71
Back Rod....	87000	105600	25.0	65.4	.29	.82	.035	.027	.24	2.71
Back Rod....	88150	104850	26.0	66.8	.29	.82	.035	.027	.24	2.71

Specimens Taken from Mid-Section of Prolongations of the Forgings

The above table compiled by the American Locomotive Company shows the chemical compositions and mechanical properties of some normalized, quenched and tempered nickel steel front, main and back rods recently produced as replacement rods for locomotives being speeded up and rebalanced. These values are typical of replacement rod forgings recently tested by that company.

Quenched and tempered nickel steel forgings of this type provide high tensile strength and ductility, combined with unusual toughness and high fatigue strength—qualities which tend to obviate breakage when employed as rods in railroad service.

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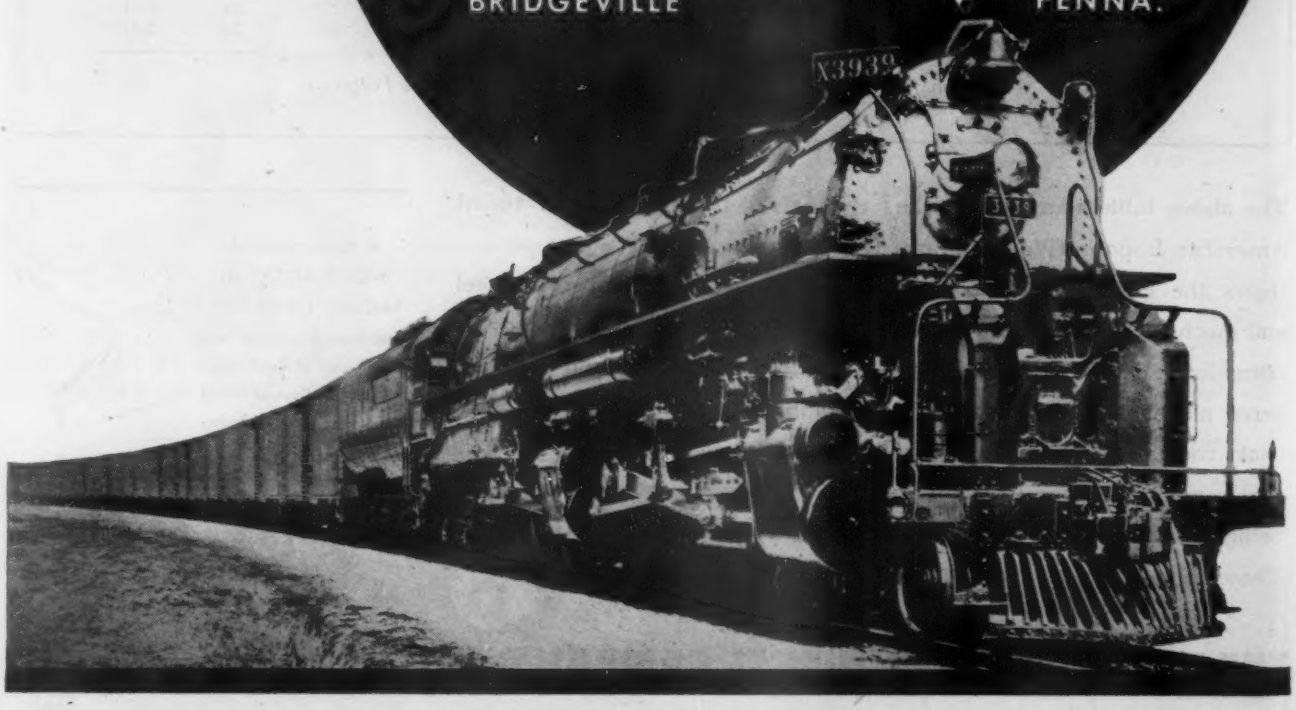
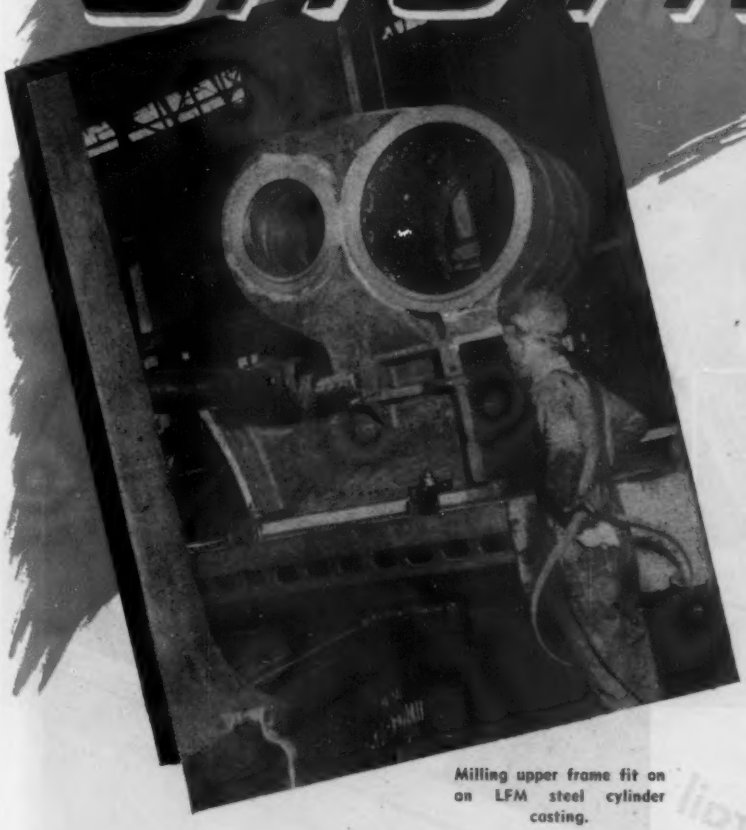


LFM CYLINDER CASTINGS



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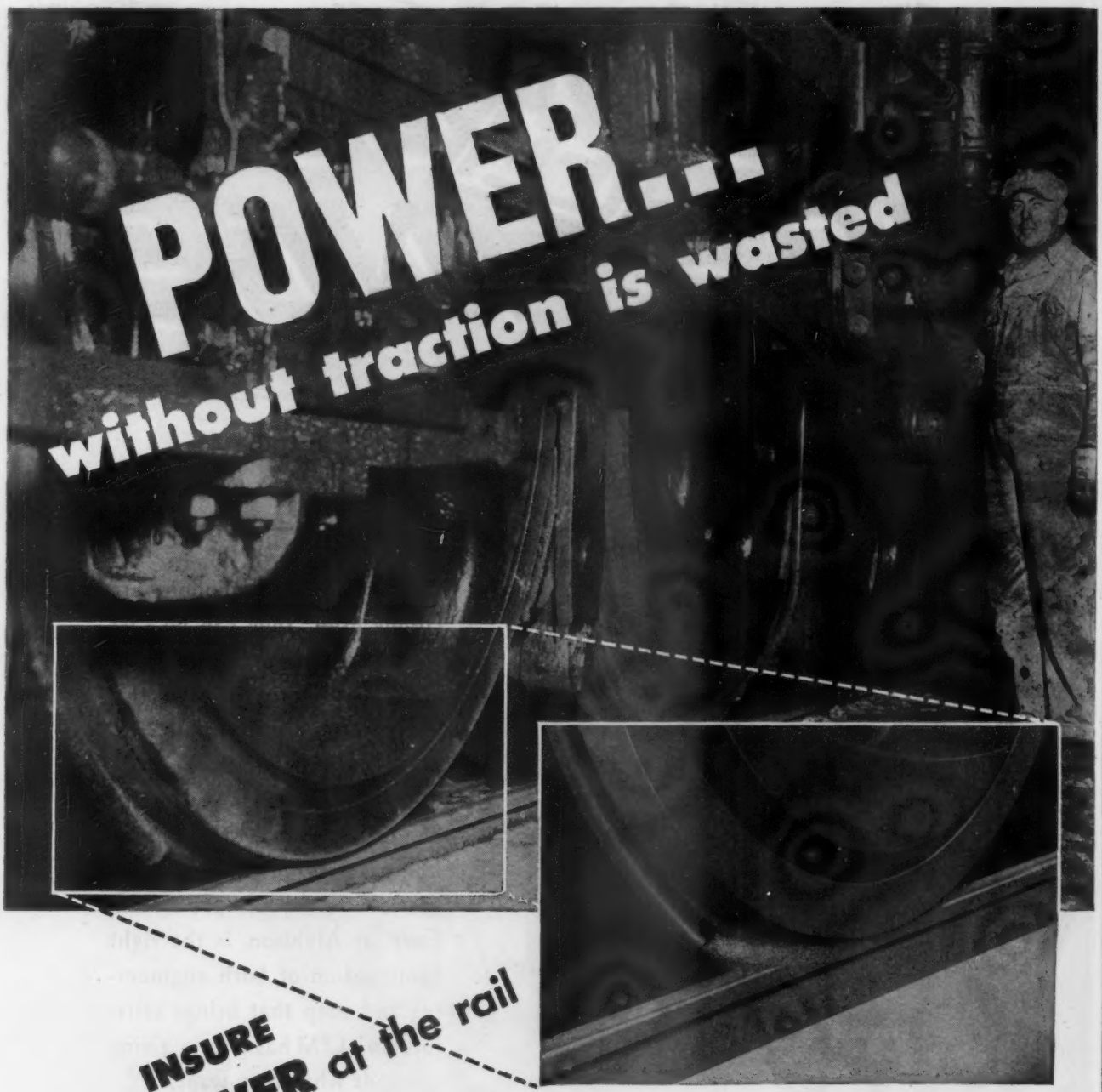

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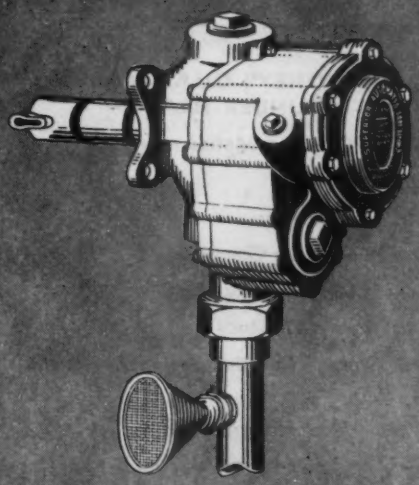

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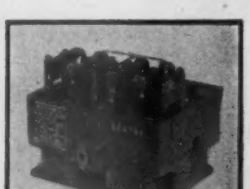

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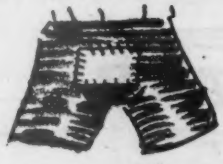

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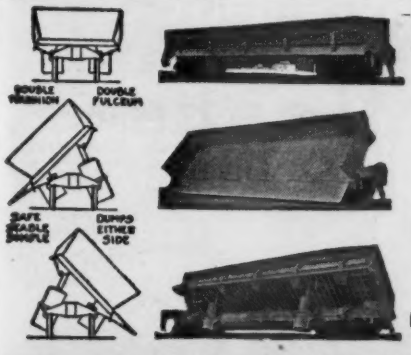

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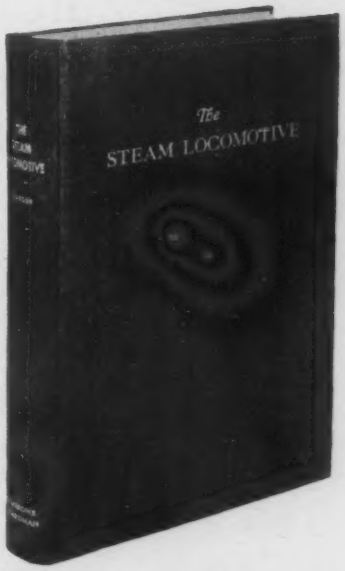

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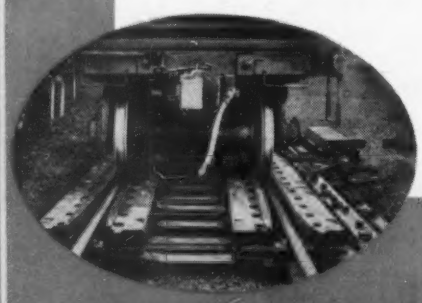

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